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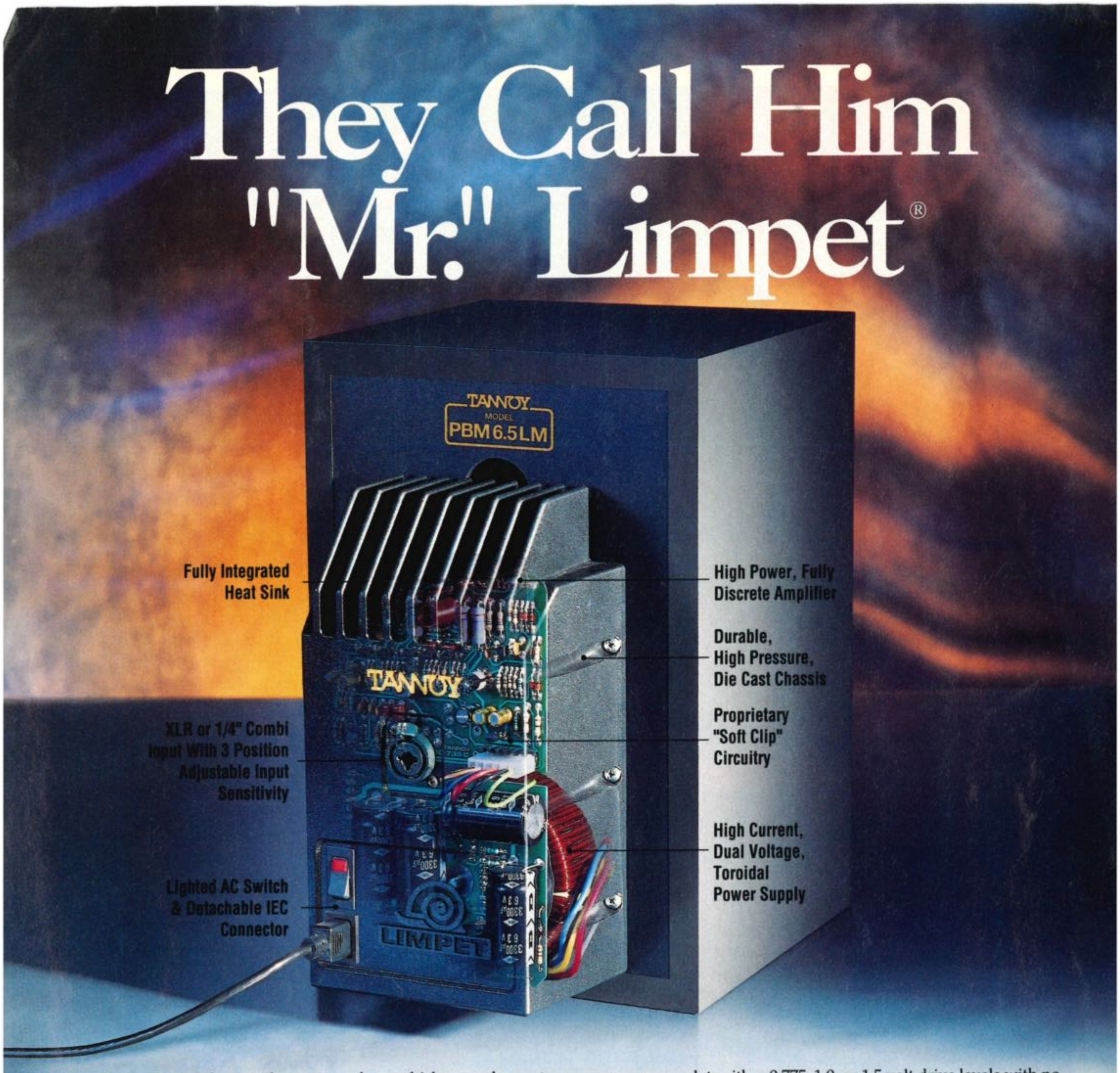
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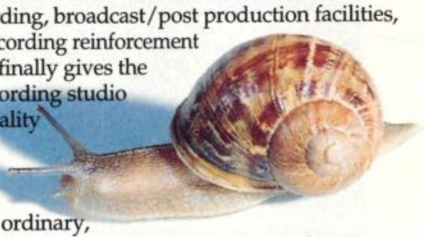

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1995 STUDIO ACTION

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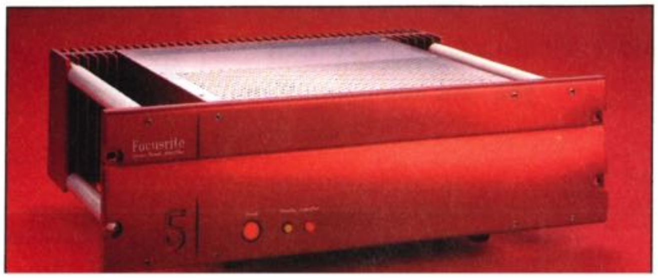

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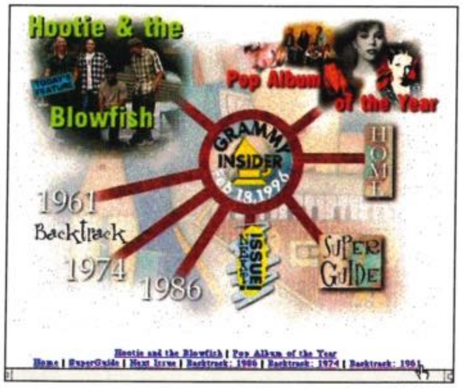
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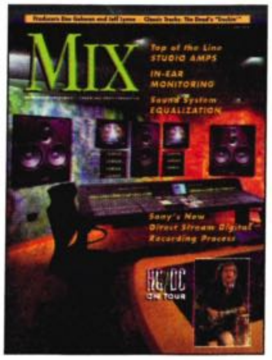
Cover: Studio Two at Strongroom Studios in London features a Euphonix CS2000M 96 console with 56 dynamics modules and an Otari PicMix multichannel pan system. Designed for mixing music and video projects, the room boasts a Neil Grant Boxer T5/T3 six-channel (LCRSS+sub) surround monitoring system, Otari MTR-90 analog and Otari RADAR digital 24-tracks.

Photo: Antony Oliver.
Inset Photo: Steve Jennings.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FROM THE EDITOR

AUSTRALOPITHECUS MIX

May 1996 has a special significance for anyone involved in technology. Exactly 2 million years ago this month, a group of *Australopithecus* hominids—early human ancestors—living near the Olduvai gorge near the base of Mount Kilimanjaro in eastern Africa began fashioning rudimentary tools for food gathering, hunting and preparation chores. Known as "pebble tools," these were little more than fist-sized rocks, split or broken to expose an edge or point at one end. But the concept of using simple tools was an enormous step in the development of humankind as we know it. Soon, pebble tools led to flint hand adzes, which after a while (at least in geologic terms) led to the carbon microphone, high-frequency compression drivers and PC-based audio measurement systems.

The technology may have changed, but whether preparing simple rock adzes before hunting in a *pre*-ice-age world, or using an analyzer to hunt for room nodes before an ice-rink rock show, the need for tools goes on. And as the complexity and power of tools increased, so did our dependence on these devices. Pocket calculators are commonplace today: When was the last time you did long division by hand or consulted a text to look up four-place logarithms?

In the coming weeks, the industry hosts two major technology shows. The National Systems Contractors Association comes to St. Louis, while the 100th AES convention steams into Copenhagen. Both will present a dazzling array of products for audio professionals, yet as we walk through trade shows, salivating over aisles and aisles of goodies, it's important to keep all this technology in perspective.

In keeping with the sound reinforcement focus of this month's *Mix*, we launch headlong into some of the burning issues facing live sound pros today. Sound reinforcement editor Mark Frink reports from Syn Aud Con's annual Live Sound Workshop and takes Ramsa's flagship WR-SX1 high-performance mixer for a test drive. Engineer Steve McCale writes about the basics of earphone monitoring systems, while Michael Santucci offers applications tips from an audiologist's perspective. Speaking of too loud, our own Sarah Jones visits AC/DC's *Ballbreaker* world tour. Technical editor Chris Michie interviews top mixer Dave Morgan and chats with engineers and designers on the subject of system equalization methods. Ironically, one of the most interesting conclusions from this article is the reality that once a system has been TEFed, CORREQTed, PREqed, SIMed or RTAed, the tweaking process is completed through a combination of the engineer's aural sense and a few favorite reference CDs—the most basic of simple audio tools.

Australopithecus would have been proud.

George Petersen

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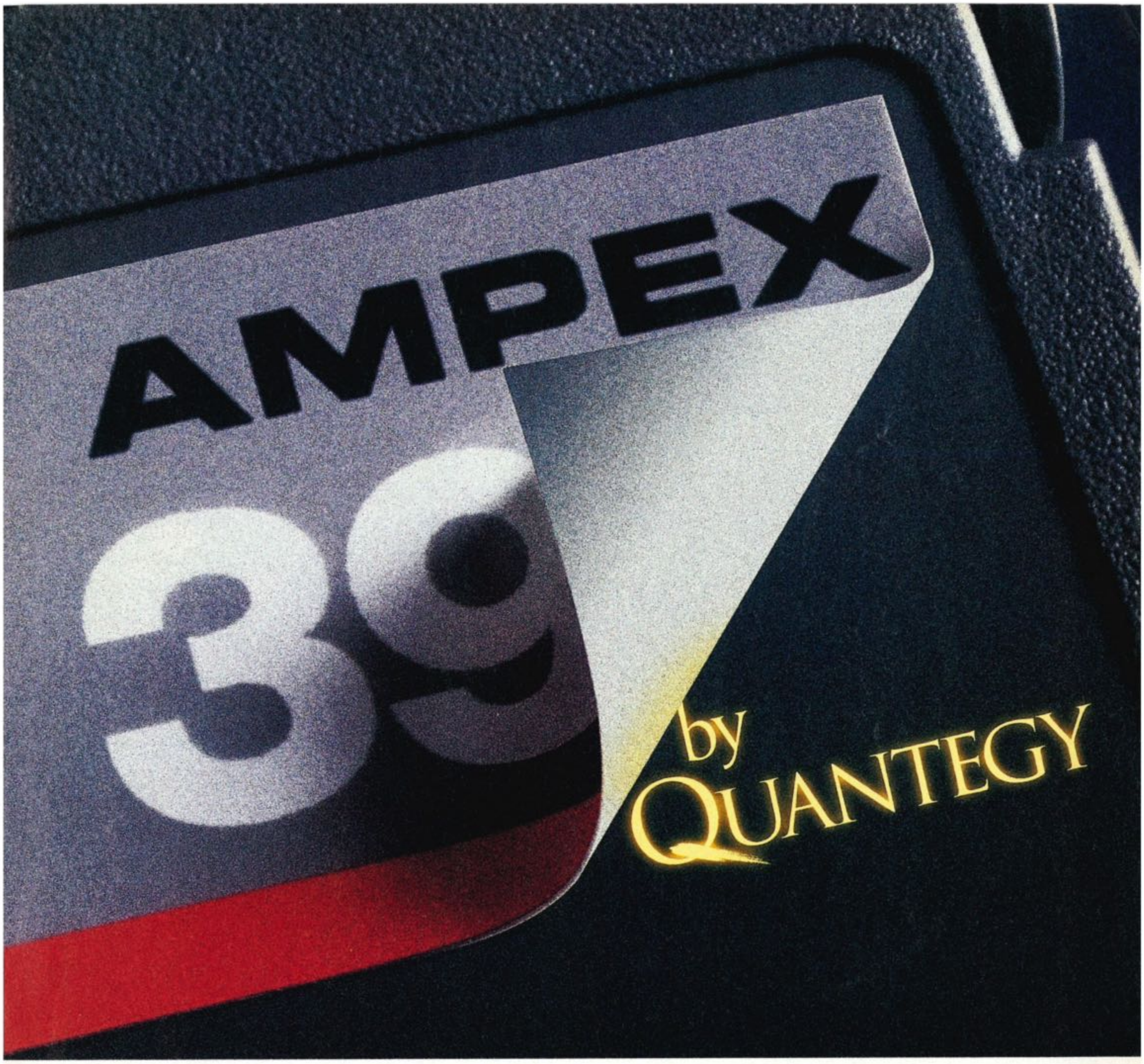

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The Bella Center in Copenhagen hosts the 100th AES convention from May 11-14. Show highlights include 150 technical papers, 11 workshops, an education fair, technical tours and social events, including an awards banquet on May 12. Additional meetings will be held in the days preceding the convention. For more information, call the AES at 212/661-8528.

NSCA '96

The National Systems Contractors Association Conference and Expo '96 is taking place this month at the America's Center Convention Facility in St. Louis. The show is being held May 12-14, and attendance is expected to exceed last year's record-breaking 448 exhibitors and 6,000 show-goers.

Preceding the Expo on May 11 will be two industry networking events for show attendees. For more information about NSCA events and registration, call 708/598-9777.

INTERNATIONAL ALLIANCE FOR MULTICHANNEL MUSIC

The future of the music business lies beyond 2-channel stereo. That was the message delivered to the 150 industry professionals gathered at the University of Southern California in Los Angeles to examine alternate multichannel formats for music and multimedia delivery. Hosted by the EC2 at USC and TMH Corporation, and sponsored by Motorola, the two-day colloquium examined the basics of multichannel audio through various types of multichannel home playback systems.

The collision course for all of these discussions, of course, is the imminent launch of the digital video disc (DVD) as a replacement for domestic VHS and Betamax video decks. The combination of a large installed base of home-theater systems and a new release medium with as much as seven times the replay capacity of the compact disc opens up some interesting possibilities for an audio-only version of DVD (not to mention new music distribution media such as advanced cable, satellite and network systems).

The conference, co-chaired by John Eargle (classical recording engineer and currently director of recording at Delos) and Tomlinson Holman (innovator of THX sound and founder of TMH Corporation), hosted sessions including a comparison between the use of multichannel audio for music playback and mixing techniques for film and video, hardware requirements, securing software revenues and musical opportunities offered by the medium.

"The challenge for the music and recording industries," Holman said, "is to define the best audio-only uses for such emerging technology, and to prepare the infrastructure required to service and expand the existing market for multichannel music. Our intention in organizing IAMM '96 was to provide a unique opportunity for music industry professionals to discuss, define and influence this new music technology."

A parallel Multichannel Hardware and Software Engineering technical session and workshop was coordinated by Terry Shultz, a leading promoter of signal processing applications for music, and currently Motorola program manager for strategic DSP application. In cooperation with representatives from Digital Theatre Systems (DTS) and Dolby Labs, Shultz discussed hardware and software designs, including the new Symphony family of programmable DSP chips from Motorola that can be set up to provide discrete 5.1-channel outputs from variable-format multichannel digital bitstreams.

A Business and Marketing Roundtable focused on the viability of a new 5.1 music format, plus use of a new Audio-DVD to carry 2-channel, enhanced bit-length material. A well-attended Recording Engineering session, presented by Eargle, detailed the primary sonic and psychoacoustic differences between phantom center images delivered by 2-channel stereophony and those from a dedicated, hard-center image, in addition to production techniques for capturing a realistic multichannel recording from classical music performances. A series of demonstrations enabled participants to hear a variety of playback formats. In the nearby Spielberg Sound Stage, attendees were treated to a number of choral and orchestral recordings made specifically for multichannel playback. Watch these pages for future developments.

—Mel Lambert

MIX PRESENTS FIRST ANNUAL L.A. OPEN

Mix magazine and the Mix Foundation for Excellence in Audio present the L.A. Open, the first golf tournament for audio industry professionals. The event will take place Monday, June 17, at the Knollwood Country Club in Granada Hills, Calif.; proceeds will be distributed to the House Ear Institute of Los Angeles for educational programs about safe hearing and the prevention of hearing impairment from loud sound sources, and to other programs of the Mix Foundation.

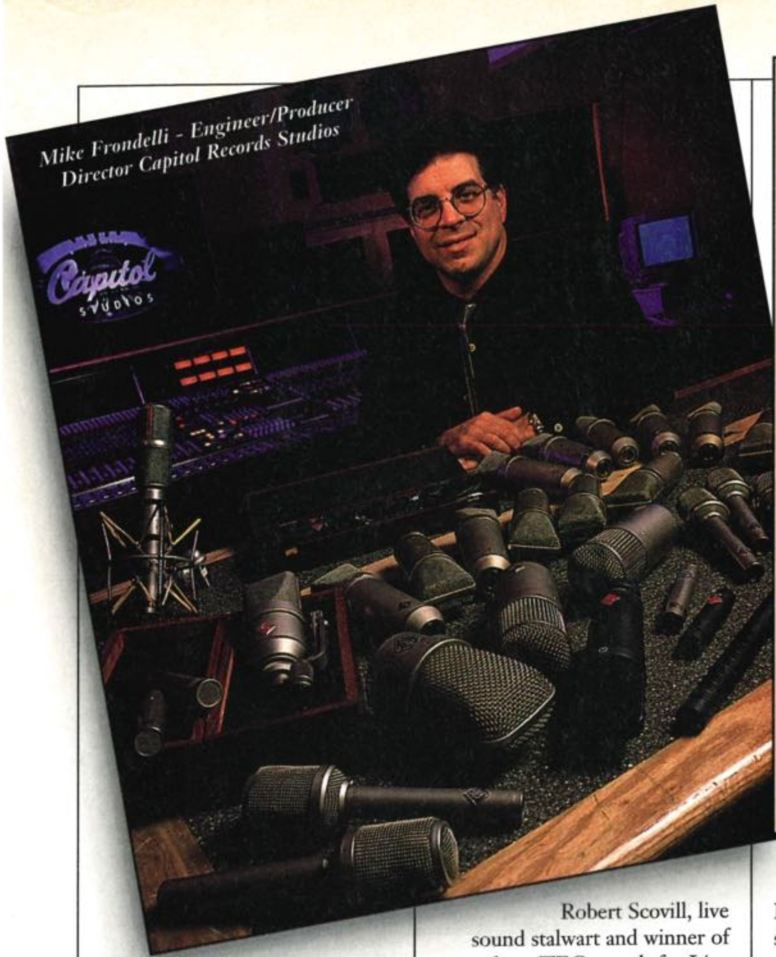
The *Mix* L.A. Open will be a "best ball" tournament with a shotgun start. Individuals or companies have been offered the opportunity to sponsor each of the 18 holes or one of three special awards: Longest Putt, Longest Drive and Closest-to-the-Pin. Cart and greens fees are included with the sponsorships or with individual sign-ups. For information, call Karen Dunn at 510/939-6149 or tournament director Terry Lowe at 310/207-8222.

DVD PREMASTERING SYSTEM

Sonic Solutions (Novato, Calif.) announced a plan for delivering a workgroup-based DVD encoding and authoring system and the launch of a DVD Production Alliance to facilitate delivery of DVD titles by the end of 1996.

The system was unveiled at last month's National Association of Broadcasters convention in Las Vegas. Called CD Creator™, it comprises audio and video compression and high-speed digital media networking developed by Sonic Solutions, along with technology from Japanese partners

—CONTINUED ON PAGE 16


Mike Frondelli - Engineer/Producer
Director Capitol Records Studios
Capitol
STUDIOS

TWO PROS WHO KNOW GREAT SOUND.

TWO MICS THAT MAKE THEM VERY HAPPY.

Mike Frondelli, Director of Capitol Records Studios, has a connoisseur's mic locker, including more than 50 Neumann mics dating back to the 1940's. Newest in the collection? The mic Mike calls "the working man's Neumann," the TLM 193. Because it sounds so good in so many applications, Frondelli recommends the TLM 193 as "the one mic to have" for Capitol acts setting up project studios.

The TLM 193 is a stripped down, cardioid-only version of our famous TLM 170. It provides oodles of headroom, has virtually no self-noise, and can immediately give your project studio that professional sound (particularly on vocals) that you've been missing. (By the way, the TLM 193 has become our biggest seller.) It carries a retail price of less than $1500.

NEUMANN · MICROPHONE

TLM 193

Robert Scovill, live sound stalwart and winner of three TEC awards for Live Sound Excellence, knows a great microphone when he hears one. He has toured as the front-of-house mixer with bands like Rush, Def Leppard and most recently Tom Petty.

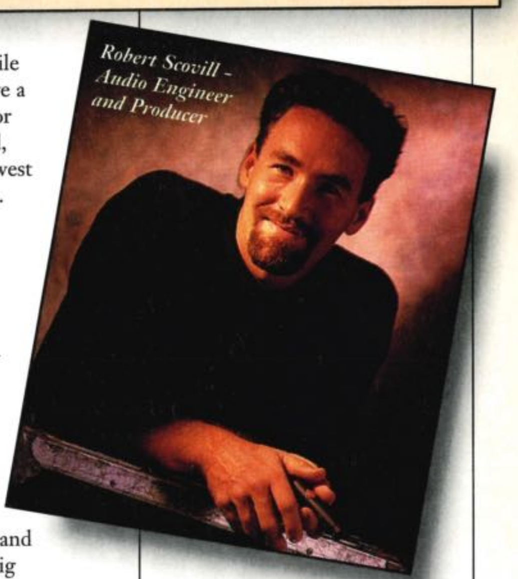
"I am using the new KM 184 both out on tour and at MusiCanvas." (Robert's studio in Scottsdale.)

"The KM 184 carries all of the Neumann signatures, and I have had great success on a wide variety of sources, from the subtleties of violin to the extremes of distorted guitar."

The KM 184 is perfect for instruments of all kinds, and excels at overhead drum miking and capturing the elusive acoustic guitar. For professional quality at less than $700 each, a stereo pair of KM 184s can easily be a part of ANY studio.

Let's face it. While Neumann mics have a stellar reputation for rich, opulent sound, they are not the lowest priced mics around. Why? Because we have to ensure that our microphones satisfy even the most demanding engineers in hypercritical recording environments. But, we *have* found a way to take a few of the bells and whistles off a couple of our mics and still give you that big (HUGE) studio sound on a project studio budget.

The bottom line is this: before you go dropping big cash on outboard gear trying to make your studio sound good, consider the most important part of the signal path, your microphones. The only way to get great sound *out* of your studio is to *capture* great sound. And no other microphone captures sound as well as Neumann . . . not even close.



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In Canada: 221 LaBrosse Ave ,
Pte-Claire, PQ H9R 1A3
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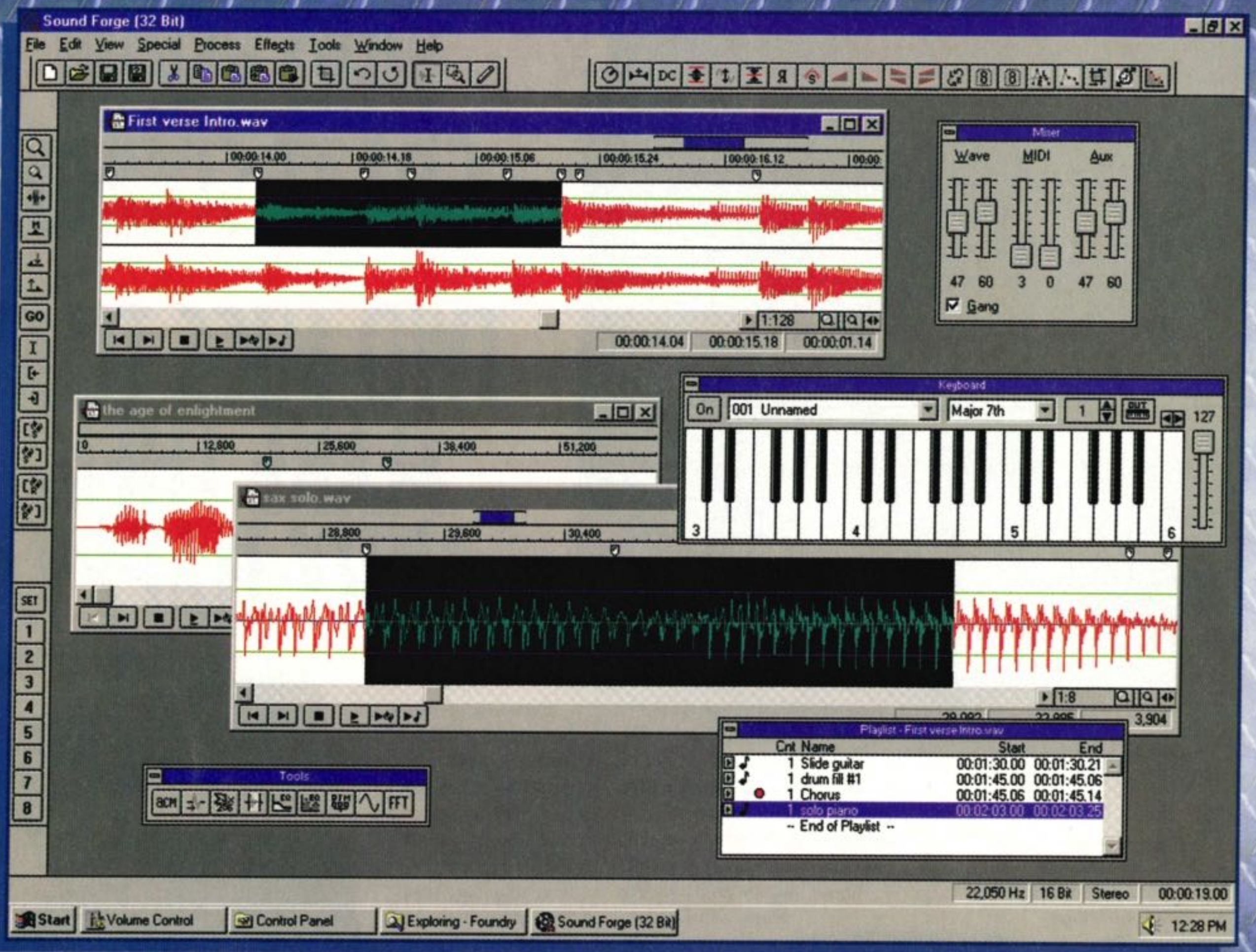
Sound Forge (32 Bit)
File Edit View Special Process Effects Tools Window Help
First verse Intro.wav
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Mixer
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Tools
ACM FFT
Start Volume Control Control Panel Exploring - Foundry Sound Forge (32 Bit)
12:28 PM

Playlist - First verse Intro.wav

Cnt	Name	Start	End
1	Slide guitar	00:01:30.00	00:01:30.21
1	drum fill #1	00:01:45.00	00:01:45.06
1	Chorus	00:01:45.06	00:01:45.14
1	solo piano	00:02:03.00	00:02:03.25
	-- End of Playlist --		

22,050 Hz 16 Bit Stereo 00:00:19.00

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SONIC FOUNDRY PLUG-INS

The Sonic Foundry Plug-Ins bring even more power to Forge's already extensive wave processing and effects capabilities. All Plug-Ins install within Sound Forge 3.0 and are accessed through the Tools selection of the menu bar.

WAVES L1-ULTRAMAXIMIZER PLUG-IN

Combines an advanced peak limiter, a level maximizer, and a high performance re-quantizer in one powerful plug-in. The Waves L-1 requantizes digital signals based on the Increased Digital Resolution (IDR) noise-shaping re-dithering process system.

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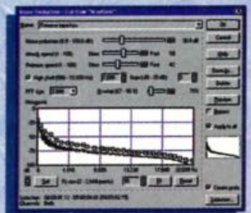
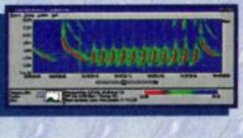


SONIC FOUNDRY NOISE REDUCTION PLUG-IN

Analyzes and removes background noise such as tape hiss, electrical hum and machinery rumble. A Vinyl Restoration tool, which detects and removes surface noise typically found in vinyl recordings, is also included.



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Identifies particular frequency components using Spectrum Graph or Sonogram display. Spectrum analysis includes one or two channel FFT analysis and six different windowing functions.

SONIC FOUNDRY BATCH CONVERTER PLUG-IN

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INDUSTRY NOTES

David Ravich was promoted to the position of executive vice president and general manager of **Fostex Corp. of America** (Norwalk, CT)...**Night Technologies International** in Provo, UT, brought on board **Richard King** as chief executive officer and president...**AKG Acoustics** in Northridge, CA, named **Doug MacCallum** to the newly created position of vice president of marketing and sales of its U.S. operations...**David Frederick** was hired as director of product marketing at Vista, CA-based **TimeLine Inc**...**Sony Broadcast and Professional Europe** (Hampshire, UK) appointed **Willie Scullion** to the post of deputy managing director, **Miles Flint** as deputy managing director and **Hiro Matsumoto** to the position of divisional director...**Jimmy Kawalek** was named market manager of engineered sound at **QSC** in Costa Mesa, CA...**Yamaha Corp.** (San Jose, CA) announced the appointment of **Law Cypress** (San Jose, CA) and **New Wave Technologies** (Gaithersburg, MD) to distribute its CD recorder products in the U.S...Calgary, Alberta-based **QSound Labs** hired **Carol Craft** as software sales and media liason...**Christine Hindley** joined **SCV London** as operations manager for the firm's UK distribution business...**Harman Pro North America** announced a new 48,000-square-foot facility in Canoga Park, CA, for the AKG Acoustics, BSS and Soundcraft product lines. The mailing address remains at 8500 Balboa Boulevard in Northridge, CA 91329; the new phone number is 818/227-1800, fax 818/884-2974...**Jon Wisniewski** is the new president of **Track One Inc.** in Lantana, FL...**HHB Communications Inc.** appointed **NXT Generation Inc.** (Greendell, NJ) as its sole authorized warranty service facility in the United States...**Keith La Honta** was hired as vice president of sales and marketing at **Musicam Express** in Reno, NV...ITA, the **International Recording Media Association**, relocated its headquarters to 182 Nassau Street Ste. 204, Princeton, NJ 08542. Telephone 609/279-1700; fax 609/279-1999...**The International Teleproduction Society** New York chapter elected **Howard Schwartz** as president. Also elected as board officers were vice president **Barry Knepper**, treasurer **Jeff Cohen** and secretary **Bill Kelly**...**Consolidated Media Systems** opened two offices in Southern Californa. CMS Burbank is located at 3815 W. Olive Avenue Ste. 101, Burbank, CA 91505. CMS San Diego is at 9540 Waples Street Ste. A, San Diego, CA 92121...**Innovative Quality Software** (Las Vegas) hired **Giles Communications** of Mt. Kisco, NY, to initiate a nationwide marketing campaign for its software products...**Sabine Inc.** recently named **Online Marketing** and **SECOM** as its pro audio reps of the year for 1995...**Pyramid Audio** is expanding. A new facility is located at 1187 Lewisburg Pike, Franklin, TN 37064. Phone 615/591-2900; fax 615/591-2901...**Aphex Systems** (Sun Valley, CA) named **Next Generation**, based in Hawthorn, IL, as its sales representative firm of the year...**Level Control Systems** has a new address: 10061 Riverside Drive #742, Toluca Lake, CA 91602...**Renkus Heinz** (Irvine, CA) announced the appointment of two new rep firms, **Northmar Inc.** in Seattle and **Pearson and Pearson Marketing** in Denver...**Thomas A. Schindler** and **Kenneth W. Graven**, principal consultants at **Charles M. Salter Associates** in San Francisco, received registration as professional electrical engineers in California...**Technomad Inc.** of Northampton, MA, hired **Griffith Sales Associates** (Marietta, GA) and **BenchMark Associates Inc.** (East Setauket, NY) as its newest sales representative firms. ■

—FROM PAGE 12, CURRENT

Toshiba and Daikin Industries Ltd.

The DVD Production Alliance is a Sonic Solutions-sponsored initiative that focuses on driving technology, functionality, authoring and encoding requirements for DVD tools. The alliance will also facilitate passage of DVD titles into retail channels in time for the holiday season. Companies participating in the alliance include Warner Advanced Media Operations, Warner Bros., Thomson Electronics and Crest National.

WILLI STUDER REMEMBERED

Willi Studer, audio pioneer and founder of the Studer Revox group, passed away on March 1 at the age of 84. Studer began his career in audio in 1948 as an entrepreneur, founding a small electronics equipment factory in Zurich. He soon developed the first Studer machine, the three-motor Studer 27.

In 1960, he joined with EMT Wilhelm Franz GmbH, Wettington/Switzerland and began international shipment of Studer products. By 1986, the Studer Revox Group had more than 2,000 employees in ten countries; today, the company is owned by Harman International Industries.

Studer was awarded an honorary doctorate in technical sciences by the Swiss Federal Institute of Technology in 1978 and received the gold medal of the Audio Engineering Society at the 1982 AES convention in Montreux.

NEW WEB SITES

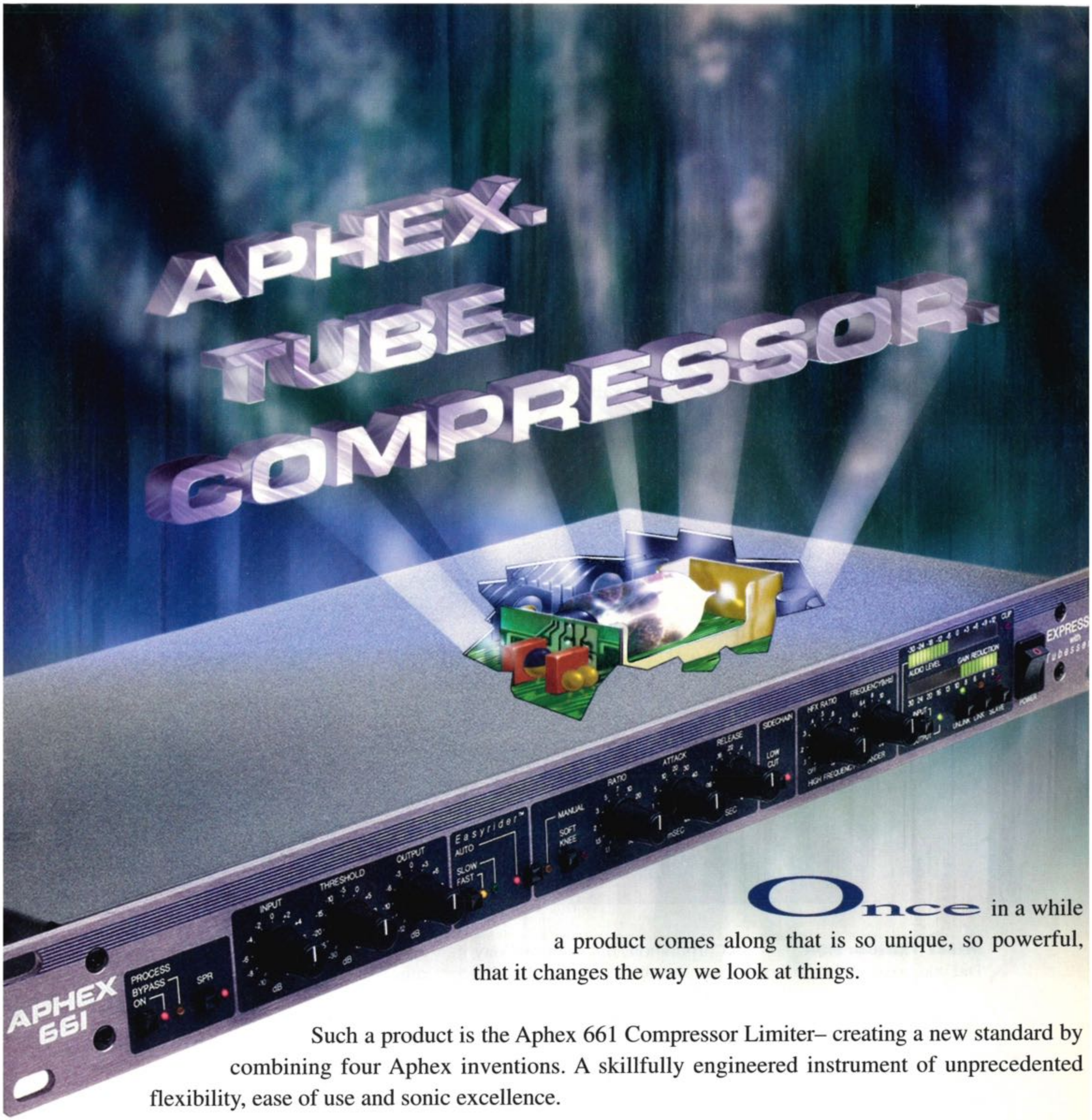
Crown Audio's new home page features product information and pictures, and publishes the most frequently asked technical questions and answers from its customer service department. Visit http://www.crownintl.com.

Modified Online, the Web page from UK-based new media group Modified, showcases live 4-track audio mixing on the Net, and will include regularly updated interactive music videos and samples for free download. Located at http://www.compulink.co.uk/~modified/.

SKB Corp. announced a Web site that includes product information, a dealer database, a chat area and a sweepstakes event. The address is http://www.skbcases.com.

CORRECTION

The New Orleans feature "The Big Easy Gets Bigger" in the March '96 issue incorrectly referred to M.R. Montero as Montero Electronics. *Mix* regrets the error. ■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SOFT KNEE
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SIDECHAIN
LOW CUT
HFX RATIO
FREQUENCY/BIAS
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AUDIO LEVEL
GAIN REDUCTION
INPUT
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UNLINK
LINK
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BY STEPHEN ST.CROIX

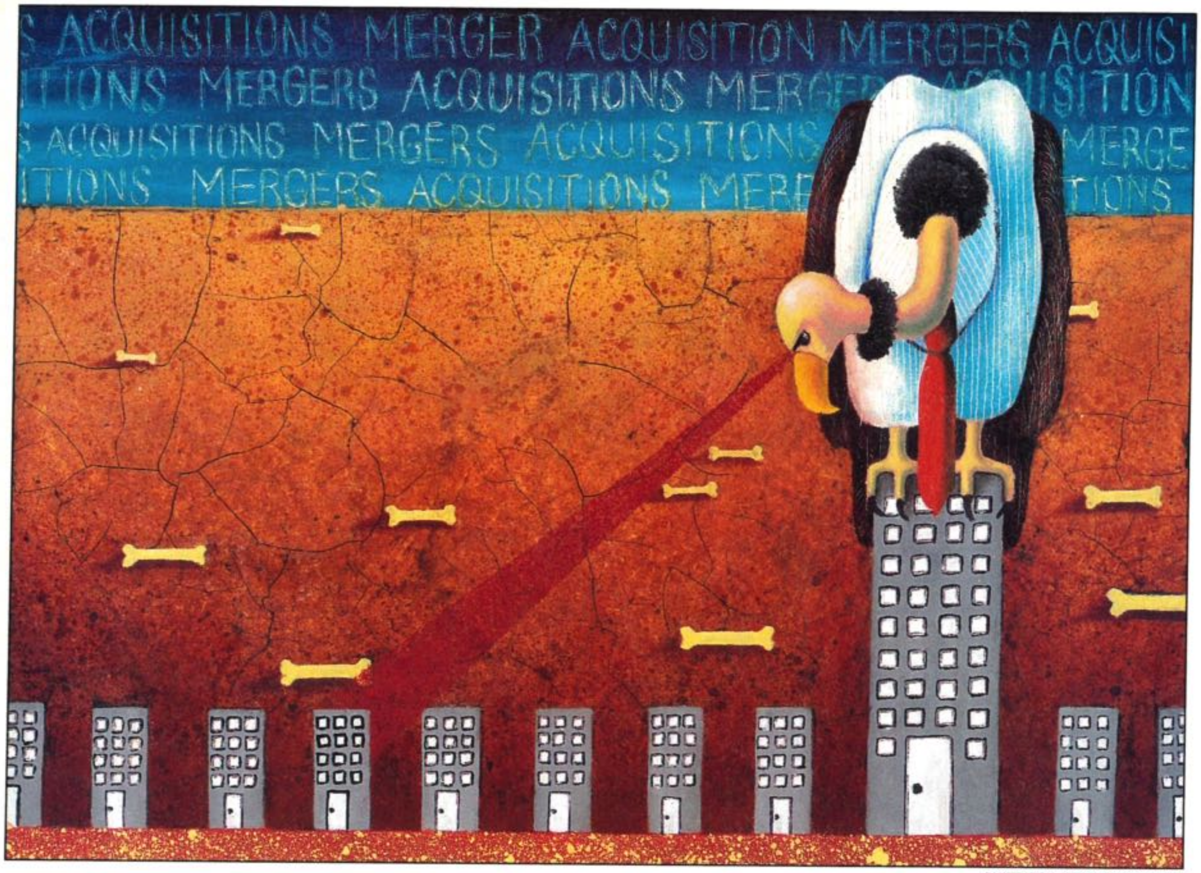
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ILLUSTRATION: STEPHANIE MCWILLIAMS

SMELLY THINGS: FISH

Did you ever see the cartoon where a little fish is swimming along, and right behind him is a bigger fish coming up on him with his mouth wide open, and behind *him* is an even bigger fish doing the same, and so on, and so on?

Those of you who have any sort of CPU in your lives must notice that the fish cartoon represents an accurate model of the software industry. Companies are being consumed (and often regurgitated shortly thereafter, only to be reconsumed by yet another big fish) on a daily basis. In some cases, this is so bad that some of us find ourselves calling information every week for the newest tech support number for some program that we depend on. Take WordPerfect: It was originally a product of the WordPerfect Corporation, but then one day it was Novell, but now it's Corel. Actually, I don't even know who to call today with a question that I have about column formatting.

Adobe is the big Softfish right now. They have been on an acquisitions feeding frenzy for a year-and-a-half or so now. Two years ago they bought Aldus. They got a *lot* with that. Then they continued, and now they have "merged" with Frame and Ceneca. Adobe is now the world's third largest software company, after Microsoft and Novell. This makes them even bigger than my software company.

You can basically desktop publish, make movies with unbelievable special effects along with multitrack audio, lay out color ads (and do color-corrected CMYK separations), design graphics and manipulate images—all under the Adobe label, *and* choose from competing Adobe-owned programs to get some of these jobs done. This is an interesting state of affairs, sort of like plasma, the fourth state of matter; very interesting, very temporary. How much longer can the Aldus and the Adobe approaches to the same task co-exist?

Actually, all this doesn't bother me too much, as Adobe products seem to be so solid, so well-thought-out and so powerful that sometimes I wish they would buy some of the other stuff I work with just so that they would fix it.

A SHORT SWIM UP A SIDE STREAM

And as a side note for those of you who've found that making music now involves ad publishing and

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The Sony PCM-2600 and PCM-2800 DAT recorders are durable enough for the daily battles of the audio professional, sophisticated enough to provide day in and day out great sound.

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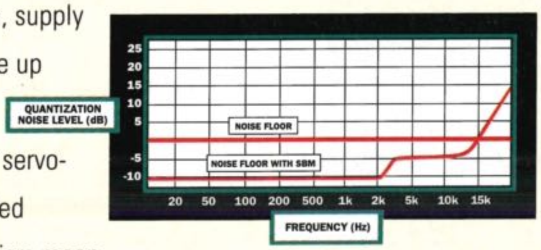

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SBM maintains much of the sonic quality of the 20-bit signal created in the recorder's advanced A/D converter and stores the data in the 16-bit DAT format. The result is superior sound resolution with added clarity and greater imaging.

And the PCM-2800 adds Read-After-Write (RAW) confidence monitoring for those critical recording situations.

But don't just take our word for it all. Call 1-800-635-SONY, ext. SBM for more information. And prepare to be blown away.

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producing graphics as well, I will tell you what I use to get through a day at my company, Marshall Electronic. First, here's a condensed list of what we do out here. We manufactured audio hardware for over 20 years. Our two big hits were the Marshall Time Modulator series and the Tape Eliminator. We also have a large music and film-scoring studio (Lightning). Audio been berry, berry good to me.

Then computers got real, so we bought some. This led to another specialized studio that does audio restoration and forensic audio recovery (we did *Gone With the Wind*, *The Wizard of Oz* and many other films and CDs), and later, a graphics studio (Marshall Arts Center, get it?) that does packaging design and corporate logo/image design (we did Spectral's Prisma Music DAW, Quantec's XLC and interfaces for several other products, both in and out of the recording industry). Last year, we launched a new sister company, Intelligent Devices, which creates software for the law enforcement and audio industries. There's more—involving weapons, racing and scuba diving—but it only gets weirder.

Anyway, every one of these companies does every one of its projects solely on Macs, including Spectral's Prisma Music DAW—a Windows product. Why? Because we *like* to. The environment is fast and powerful, and the software available is incredible, and improving every Monday.

Now to the point of this side trip. For those of you who may be starting to expand beyond actual audio recording into the realm of all the stuff next to it, here is what we use to do it. We paint with the only game in town—Fractal's Painter. We do all our 3-D modeling (the silver ice Spectral Logo, the Intelligent Devices metal text, and many other corporate logos) in Specular's Infini-D. We put it all together in Adobe Photoshop, and use HSC's Live Picture for really huge files. We process these images with every Photoshop plug-in that HSC makes. We use every GE filter (yet another Adobe acquisition) that there is. We do page layouts for ads with Adobe (Aldus) PageMaker, and books in Quark. We do animation and any moving-image work using a bit of serious hardware and Adobe Premier, Adobe After Effects (still another Adobe acquisition) and HSC Final Effects.

> **There seems to be as much food chain activity in our little industry as there is in the software world.**

We have a lot of fun, are very productive, and we actually make *more* music than we did before we diversified.

SMELLY THINGS: FLOWERS

Okay, back to the original path. Does a rose by any other name smell as sweet? Does OSC under the name Macromedia work as well? Or how about Lexicon, Studer, DigiTech, DOD, BSS, Allen & Heath, Soundcraft, Turbosound, Orban and AKG all being absorbed by the Ultimate Audio Amoeba—Harman International? Harman has certainly carved out a position as one of the biggest Soundfish of recent time.

Remember when Sony made a late-night snack of MCI, and then every label and movie theater that they could

—*CONTINUED ON PAGE 231*

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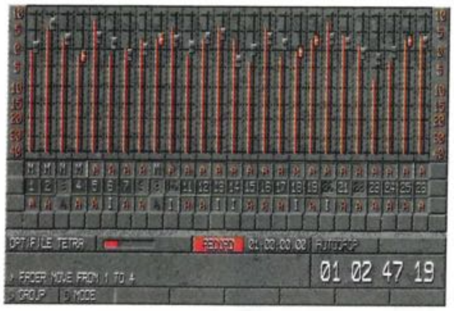

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If our marketing department had been as talented as our engineers, you'd probably be using a Prisma™ workstation right now.

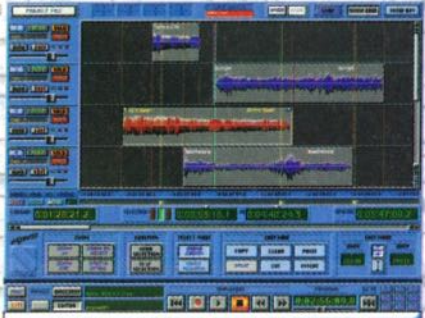
The alternative workstation.

Okay, granted, there are already a lot of digital audio workstations out there. Some are so expensive that you can only afford one for six editors. Some are little more than PC sound cards that can't lock to picture without timecode drift. Some are so complicated that after you've bought a Mac™, 5 add-in boards, a bus expansion box and 12 pieces of software, it almost nearly works most of the time.

That's why you should explore our radically different approach. Admittedly, we're guilty of spending far more time perfecting our products than advertising them. But today, a growing number of major post production facilities and recording studios are reaping the benefits of our meticulous engineering. They also rave about our great service and quick support – available without having to wait on hold for hours.

One hardware platform; three software solutions.

Prisma™ is our one-card hardware platform that frees up your CPU by handling all processing and signal flow on board. Its DSP capabilities are so massive that plug-ins aren't even an issue. Invest in Prisma hardware and then choose the Windows®-based software package that fits your applications and budget. Each has an elegant, hands-on interface that's free from frustrating pull-down menus, and floating window clutter.



EXPRESS™ for PRISMA™

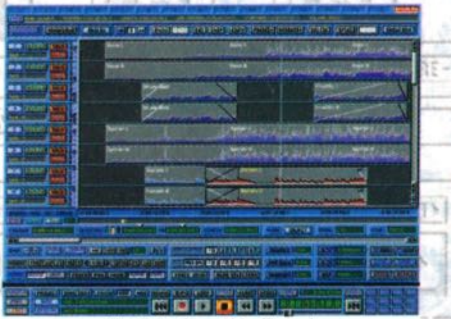
Express™ presents a simple, 2-panel interface with all the tools you need on-screen – instead of hidden in a mass of annoying pulldown menus. Perfect for broadcast, commercial production, multimedia and small home studios.

8 tracks • Over 250 markers & 99 Auto Locate points • 10-level Undo/Redo • Fader automation • Directly-draggable fades & cross-fades • Easy head & tail trim • Fast bi-polar waveform views • Snap anything to markers, current position or other sounds • Compatible with & upgradable to Producer™ • Networkable

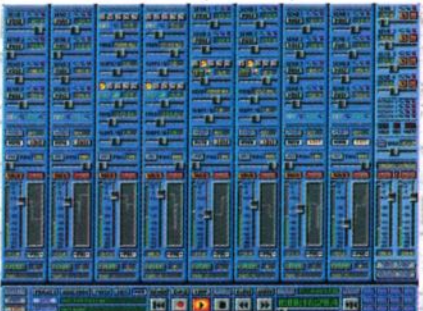
Express™ is a creative tool for broadcast and commercial production with a no-frills interface so simple to use that even a program director could learn it. It uses Producer's hot-key shortcuts to reduce the learning curve if you upgrade.

Producer™‡ takes the software recording studio paradigm to a new level. Its studio-friendly look and feel removes the impediments to creativity found in many current workstations.

StudioTracks™ **XP** has the tools you need for serious, hardball film and video post production, sound design, dialog editing and Foley work. XP stands for Cross Platform: StudioTracks runs on both Prisma and Spectral's even-more-powerful AudioEngine™ hardware, too.



Above: Producer Edit panel; below: Mixer panel



PRODUCER™ for PRISMA™

Radically different than any other workstation software, Producer™ is a "virtual studio" with direct access to familiar audio tracking and mixdown tools including an automated mixer. Free from pull-downs and nested windows, Producer's direct interface boosts productivity & creativity.

99 virtual tracks, each w/4 layers • 8/16*/24* or more tracks • 4 sends & returns + 2 remix tracks • Rich DSP features • 10 Undo levels • Automated fades, pans, mutes, aux sends • 2 EQs per mixer channel • Default cross-fades & butt-splices or custom via built-in editor • Markers • Snap anything to anything • 3 waveform views incl. fast bi-polar waveform display • Grid can be set to bars/beats, frames etc. • Direct VITC lock • Can add timecode burn-in to video • Networkable

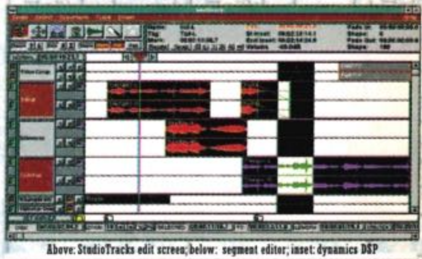
*via linked CPUs

Get the whole, hitherto untold Spectral workstation story.

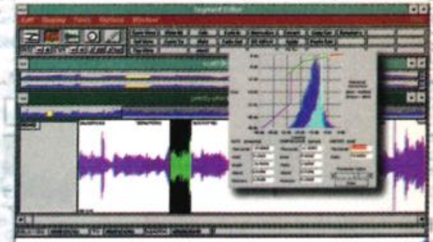
Prisma™, Express™, Producer™ and StudioTracks™ are just part of our product line. They all come from an established company that specializes in digital audio workstation and connectivity solutions. Call, fax or e-mail for complete, detailed information on our practical approach to enhanced productivity.

We've been keeping it a secret for far too long.

‡The software program Formerly Known As Prisma Music. Our *previous* Marketing Department did it.



Above: StudioTracks edit screen; below: segment editor; inset: dynamics DSP



STUDIOTRACKS™ XP

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256 virtual tracks • 12 tracks w/2 sends & returns • Internal track bouncing • Auto-Conform • Direct VITC lock • Drag & drop SFX & dialog snips from library to project • Spectrum analysis • Flexible dynamics processing • Silence-stripping • Envelope editing • 2 EQs per channel • Digital patchbay • Textual play list for mix-to-pix or mastering • Machine control • Networkable

*Runs on Spectral's Prisma™ & AudioEngine™ hardware

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INSIDER AUDIO

SOUNDING OFF

WHAT HAPPENED TO THE FOH MIX?

BY PAUL D. LEHRMAN

My friend Grumpmeier barged, unannounced as usual, into my office. "I hear they want you to write about sound reinforcement!" he snarled. "Just what do you think you know about it?" He planted himself on my desk. "Well, as much as the next guy," I replied. "I thought I'd talk about some recent advancements in automation, and delay-line design, and real-time impulse response analysis, and fiber-optic networks and..."

"Bfffpt!" he interrupted, with a sound I hadn't heard outside of the Bronx since the Red Sox blew the '86 Series. "How about telling 'em all live sound sucks!?"

"Oh, I couldn't do that," I said. "I have friends who mix sound and clients who make the gear, and we have advertisers..."

"Forget them!" he barked, as he jumped to his feet. "They're all full of it. Live sound is a joke. Here, what do all these people have in common: Bob Dylan, Richard Thompson, Richie Havens, the Grateful Dead, Patti Smith and Emmylou Harris?" I tried to be helpful. "They're all dinosaurs?" "No, dummy, they're all people I've paid good money to see in the last couple of years, and they all sounded awful!"

Dylan? I thought he was only playing medium-size theaters, with a small band. How could the sound be bad there? "I'll tell you how. All you could hear was drums. Couldn't understand a word the whole night. I mean, Dylan mumbles a lot, but most of the time you couldn't even tell whether or not he was singing. The guy at the mixing board, even though he had a clear path to the aisles, never moved, never walked away to see what it sounded like anywhere else. In fact, now that I think of it, I don't remember him ever taking off his headphones. Maybe it sounded great in the cans, but it sure sounded awful where I was. To make it worse, even though he had a real hot guitarist up there with him, ol' Bobby insisted on playing guitar hero in every tune. He only knows about three notes, but I guess the sound guy liked 'em, because every time Dylan hit his lead switch, that's all you could hear, those three notes over and over again. For this I paid 35 bucks!"

Okay, but how could

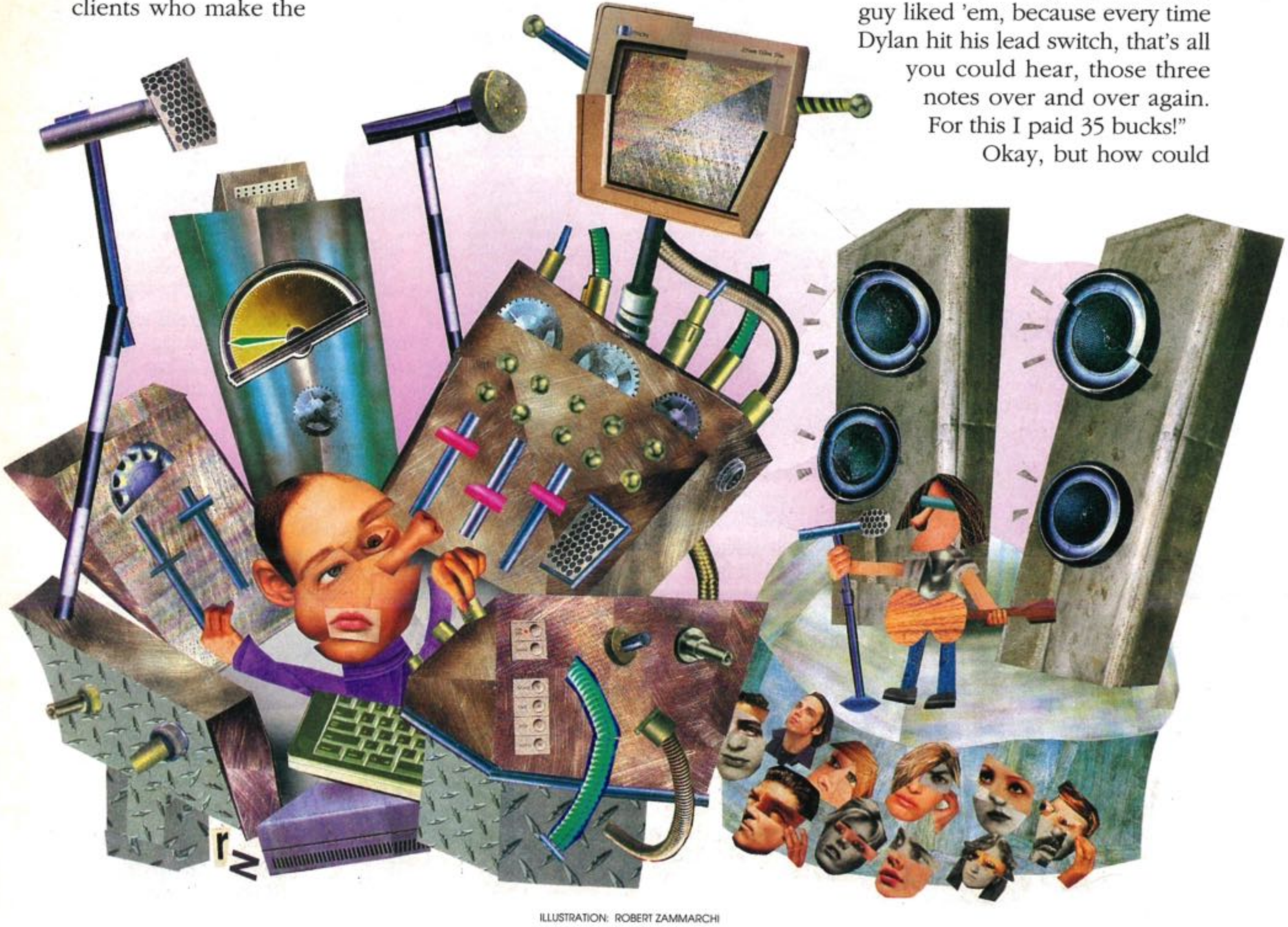

ILLUSTRATION: ROBERT ZAMMARCHI

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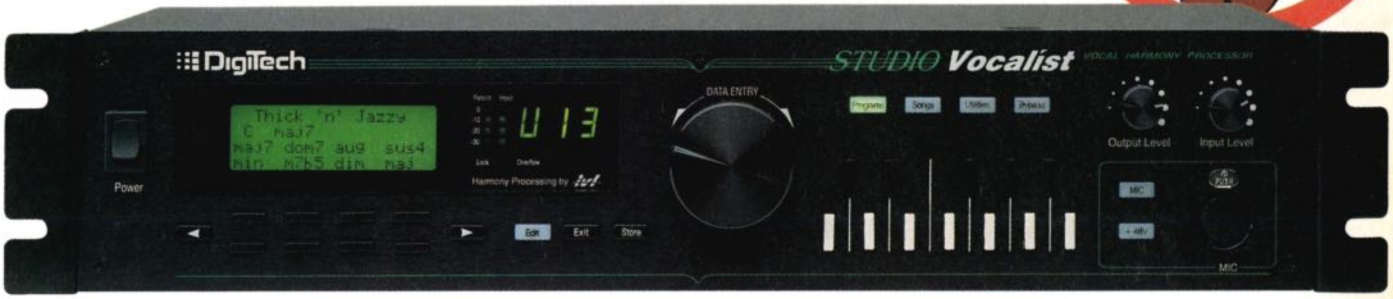
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U 13
Harmony Processing by
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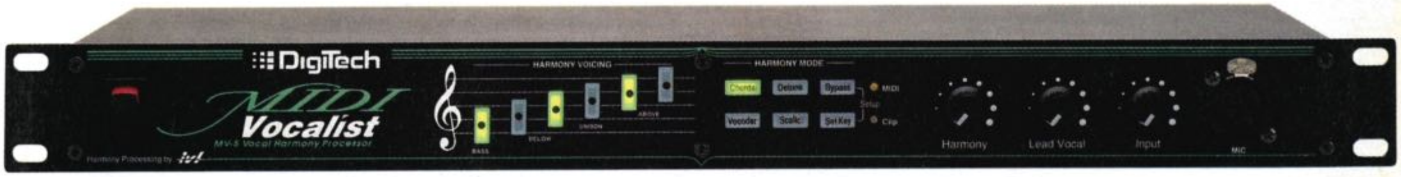
ELECTRONIC MUSICIAN
1996
EDITORS' CHOICE

WITH THE NEW MIDI VOCALIST, GREAT HARMONIES ARE A SIMPLE TOUCH AWAY.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Richie Havens sound bad? He's only got one or two musicians up there with him. "You'd think that would be hard, huh?" said my friend. "It was an outdoor show in a park in the middle of a city. They made a grass-covered amphitheater and brought in a really nice sound system. We'd heard a whole international folk festival there the week before, with a dozen different acts in two hours, and it sounded pretty good. Havens played with just an electric guitarist and a conga player, but the balance was ridiculous. The conga was so loud, it was bouncing off half the buildings in town, and the guitar was on the edge of feedback most of the time. Richie probably would have been better off not showing up. I know I would have."

And the Dead? C'mon Grumps, their attention to sound was legendary. They probably had the most evolved system in the business, and their crew was with them for years. "That was an interesting one." He was warming to his topic. "You know, I used to see them at the Fillmore East, before they started going nuts with that 'Wall of Sound' thing, I thought they sounded damn good just through those stacks of Altecs. You could hear every note, from wherever you were sitting. It had been years since I'd seen them, and a coupla years ago I thought I'd check them out at the Boston Gahden—thank God they've finally closed down that toilet. Turned out it was the last time they would ever play Boston.

After The Beatles tried to play Shea Stadium and nobody could hear anything, either on the stage or in the stands, they realized it was ridiculous for them to tour any more. But no one else has bothered to learn that lesson.

"I went on the third night, figuring they'd have all the kinks worked out by then, ya know? So half the floor is taken up with this sound booth, which has got more computers than NASA, and there's 2,000 pairs of shotgun mics sticking up in the air, like the fans expected there was really going to be something worth recording. The whole first half of the concert, there was just this dull roar, really loud, and totally undifferentiated. Can't even tell who's playing. Garcia looks like he's about to fall asleep, and Bobby Weir looks pissed off, and they obviously can't hear anything onstage either. The fans think they've gone to heaven, but I just wanted to run out of there as fast as I could. But they did finally get it together—the sound guys I mean—during the drum solo, and the band came back and you could see on their faces something had changed, so they played a pretty decent second set. I know it's not the easiest room in the world, but with all that technology, and all that experience, and all those

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CLASS 2 EQUIPMENT

people, how come it took 'em three days to get any kind of mix?"

"But Grumps, you listen to a lot of different types of music," I said. "Jazz, and folk, and that world music you're always talking about. All the new clean-sounding mixing boards and high-efficiency speakers around must be helping that scene out a lot."

"Hah!" he rejoined. "It's just as bad. Everybody wants to have the coolest sound equipment in the world, even if it's just two clowns with guitars. But half the time, all those toys just make it worse. I went to check out this really interesting group, four women singing a cappella in half a dozen languages, and playing hand percussion. Someone decided it would be cool to give them wireless headset mics. But nobody told them how to wear them. So one of them had that little Styrofoam-ball wind screen right up under her nose, and every time she breathed, it would set up a standing wave at about 35 Hz that I swear was making people's fillings fall out. This was in a really well-tuned hall, built for electric music, so that sound just hung there. People were looking at each other wondering whether there was an earthquake. The sound board must have been at some cancellation point, or else the mixer was wearing cotton in his ears, because it went on like that for almost an hour.

> **No matter how much power you throw out there, or how hip your time- and frequency-domain processing are, there's no way to produce anything that sounds decent in a football stadium.**

"What solved it was that they started to get taxi calls in the speakers. Heck, the theater was about a block from the two largest transmission towers in the state, handling UHF, VHF, FM, cellular, microwave and who knows what else, each one pumping out a few dozen megawatts of ERP from DC to light, so something's bound to creep in to the wireless rig, am I right? So after a couple of minutes of hearing some guy with marbles in his mouth asking whether anyone feels like going to the airport, they yanked the headset off the woman with the heavy breathing and gave her a hand mic. Immediately, you could feel 2,000 shoulders relax. And from then on, it was a great concert.

"It's laziness, man." He was on a roll, so I just shut up. "It's like the sound companies hear that some machine will do half their work for 'em, so they buy two. They've got automatic equalizers, spectrum analyzers, power monitors, gates on every input and output, MIDI-controlled snapshot automation, but no one's *listening*. Sometimes I think it's like what's happening in the medical industry, where your doctor isn't allowed to tell you that you have a cold unless you've had a week of tests. There's so much money riding on these shows that no one trusts anyone to run the gear. Leave it all to the machines—that way,

---

VP 12
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if the thing comes out awful, there won't be anybody to blame or to sue.

"I don't blame the sound companies completely—the bands and the promoters are trying to make as much as they can in as few days as they can, and so they're booked into impossible places. I mean, after The Beatles tried to play Shea Stadium and nobody could hear anything, either on the stage or in the stands, they realized it was ridiculous for them to tour any more. But no one else has bothered to learn that lesson.

"The manufacturers have an impossible job, too. No matter how much power you throw out there, or how hip your time- and frequency-domain processing are, or how many giant neon stairways or inflatable donkeys you build, there's no way you're going to produce anything that sounds decent in a football stadium. You've got steel and concrete, and slapback delays into next week, and two-thirds of the audience sitting at 90-degree angles to the stage. These are places designed to sell beer, not for listening to music.

"But as far as I'm concerned, the ones who are really at fault are the fans. As long as they're willing to put up with this nonsense, it's going to go on. If they're going to stand outside some ticket outlet all night and then shell out 50 or 60 bucks for the privilege of being somewhere in the same ZIP code as someone they've seen on MTV, and be *grateful*, then I don't think they're going to be all that picky about how it sounds. If it sucks, they're certainly not going to complain to anybody about it. But it makes me sad. Obviously, these performers got where they are because they had at least *some* talent, but if the only time we can hear them is through an overblown, no-human-intervention, let's-reach-the-next-county sound system in an acoustically irredeemable setting, we'll never get the chance to know what it was."

Grumpmeier slumped back down onto the desk, obviously exhausted. He reached over and grabbed the floppy disk sticking out of my computer and started brushing the lint off his jacket with it, immediately erasing the column I thought I was going to run this month. "So, do you mean you haven't heard a decent concert in two years?" I sighed.

"Of course I have. I heard a local band at a church hall last month. High-energy, world beat rock 'n' roll, with really elaborate arrangements, lots of percussion, three-part harmony vocals. The place was a nightmare—high ceilings, huge windows, and what wasn't wood was cinder block. And they sounded great! The sound guy—there was only one, and he was probably getting something like 50 bucks for the night—had a little 16-channel mixer, a reverb and a couple of power amps, and that was it. But he never sat still. He would jump around the hall, listen, run back to the board and tweak, ask people how they liked it, run up next to the stage to listen to the monitors, I even saw him go outside to hear how it was carrying. It took him about half a song to get it to sound pretty good, but he didn't stop; he kept right on running around, making it better. The band was hot and really tight, they could obviously hear themselves just fine, and everybody had a fine time. And it only cost me six bucks to get in."

If I know Grumpmeier, that was his favorite part. ■

Paul D. Lehrman, composer, educator, music fan and long-suffering writer, has recently started locking his office door.

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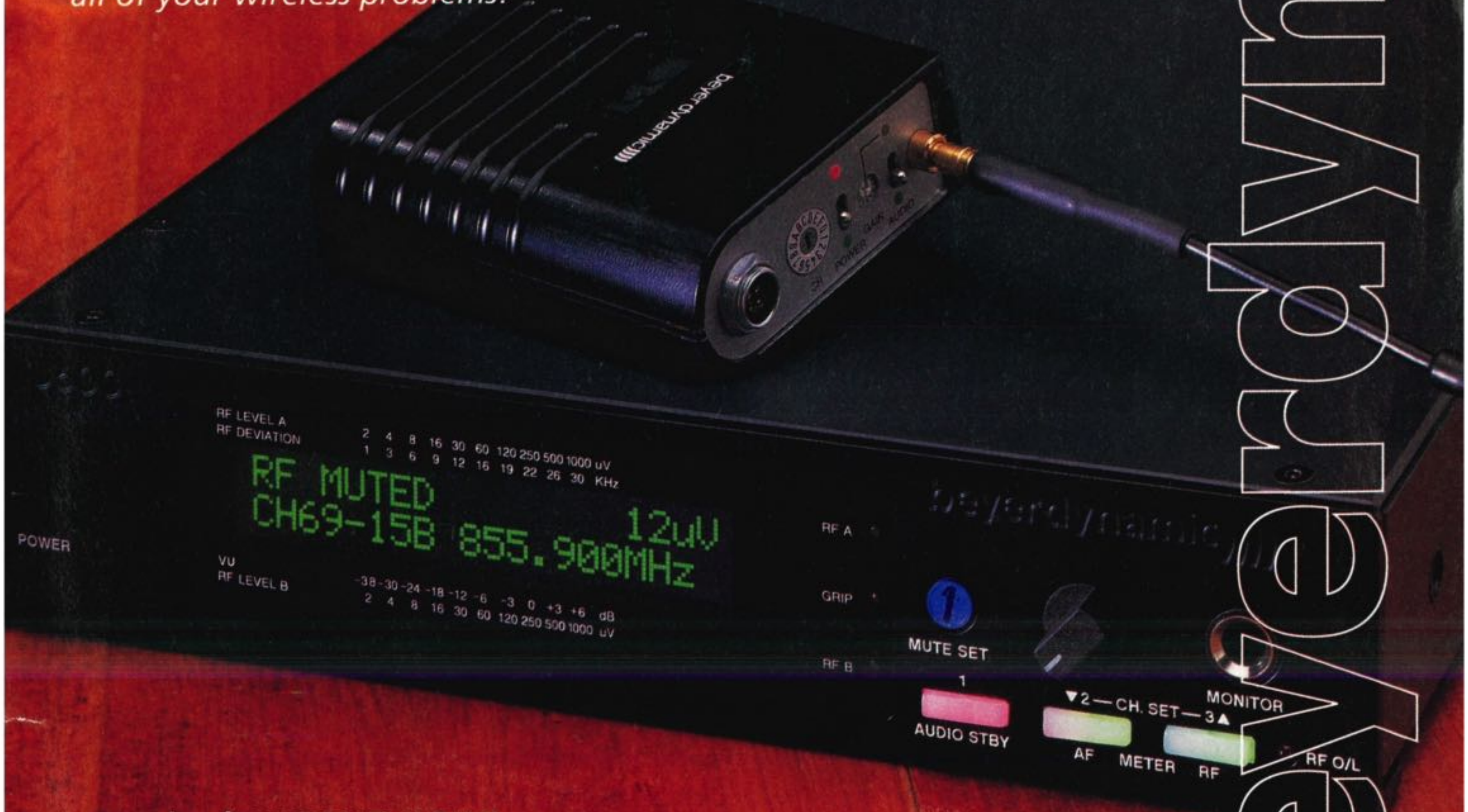

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16 Track Disk Recorder

EVEN MORE FEATURES:

- Balanced 1/4" TRS in/out
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- in 16 out + stereo master (DR16)

Media The DR8 can be equipped with an optional internal 1 GB SCSI drive, while the DR16 is available with an optional 2 GB internal SCSI drive. The DR Series recorders are both equipped with a standard 50 pin SCSI port alowing a combination of up to seven SCSI drives with disk overflow recording capability. Lists of compatible drives are available from Akai product information.

Data backup is achieved through standard audio DAT or Exabyte.

At the time of this writing, the Iomega Company is preparing to go into production with their new 1 GB "JAZ" drive, a removable media SCSI drive which will greatly enhance the capabilities of our new DR Series recorders. Stay tuned for more info in our upcoming ads. Better yet, test drive a new DR Series recorder today at your local Akai dealer.

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8 channel 3 band parametric EQ - $550
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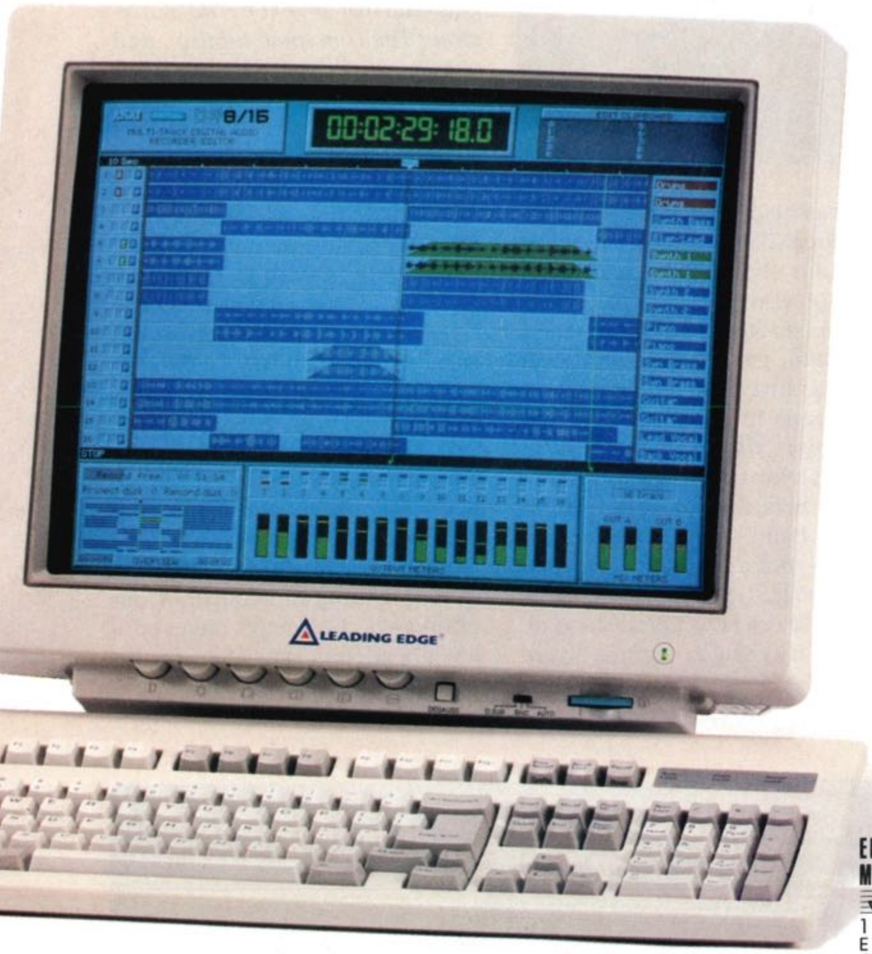
Mixing Some of our competitors' disk recorders use a portion of their recording LSI to provide mix capability. While this saves money, it can also produce audio artifacts like "zipper" noise when adjusting such critical functions like EQ, pan, and fader level. On top of that, many disk recorders won't even let you make real-time adjustments during mix down, eliminating a critical part of the creative recording process. The heart of the DR mixer is a 16-channel, 24 bit custom LSI designed to provide real-time dynamic digital mix capability. Built-in 99 scene snap-shot automation for all functions and dynamic automation via external MIDI sequencers, combined with 8 or 16 channel 3-band parametric EQ option, ensures that the only limit in the DR Series mixer is your imagination. With its built-in 16 channel mixer, the DR8 becomes the perfect compliment to any 8-track recorder you might currently own. It can mix down its 8 tracks of internal digital audio with an additional 8 inputs from a sampler, tape machine, or a live performance, all in the digital domain. The MT8 mix controller provides a 16 track console format for dynamic remote control of all mix and EQ parameters.



(Monitor/Keyboard/Iomega Drive and Batteries not included.)

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DON GEHMAN

NICE GUYS FINISH FIRST

The biggest-selling album of 1995 wasn't by a household-name act or some angst-ridden flavor-of-the-month publicity darling. It was by a group of down-to-earth average Joes from South Carolina whose image is so downplayed that their album cover contains only blurred silhouettes of the band, and their name misleads many as to the identity of the lead singer. While Michael Jackson was barely making *HIStory* (in spite of the self-ordained "King of Pop's" huge publicity blitz), Hootie & The Blowfish went on to move an astounding 14 million units of their debut record, *Cracked Rear View*.

The production vision behind this astonishing sales success is Don Gehman, a journeyman producer/engineer who understands the value of good songs, performances and the need for supportive, unobtrusive production work that can still shoot sparks.

Gehman got his start working for the Clair Brothers concert sound company in the '60s. During his seven-year stint there, Gehman did live sound for premier acts such as Crosby, Stills, Nash & Young, James Brown, Yes, The Supremes, Loggins & Messina, Chicago, The Temptations and other major headliners of the day.

He was also involved in putting together Clair's groundbreaking modular flying P.A. and stage monitor systems.

Stephen Stills, sensing Gehman's potential, gave the young engineer his first break by taking him to Criteria in Miami to work on the artist's *Illegal Stills* album in 1973. Gehman's first production credit was the Platinum Stills-Young Band's *Long May You Run* album—not a bad start. After that experience, Gehman momentarily decided to eschew a production direction, choosing to dig in as an engineer and learn under great producers such as Tom Dowd, Bill Szymczyk and brothers Ron and Howie Albert. During that time, Gehman manned the board for Barbra Streisand, the Bee Gees, Pure Prairie League and other notable acts.

BY RICK CLARK

His next significant production was John Mellencamp's 1982 mega-Platinum *American Fool*. That led to a string of hugely successful projects with that artist (*Uh Huh*, *Scarecrow*, *The Lonesome Jubilee*), and opened the door for him to work with artists such as R.E.M. (*Life's Rich Pageant*), Jimmy Barnes, Treat Her Right and many others.

As well as wrapping up work on the second Hootie & The Blowfish album (tentatively titled *Fairweather Johnson*), Gehman's more recent projects include The Dambuilders, Clarissa, Ugly Americans and the critically lauded latest effort by Tracy Chapman called *New Beginnings*. A résumé like that, coupled with Hootie's phenomenal success, could encourage many people to begin blowing their horns rather gracelessly. Don Gehman definitely doesn't resort to that. During the course of our interviews, Gehman conveyed a level-headed appreciation for his good fortune. He was also quick to give credit to others and happy

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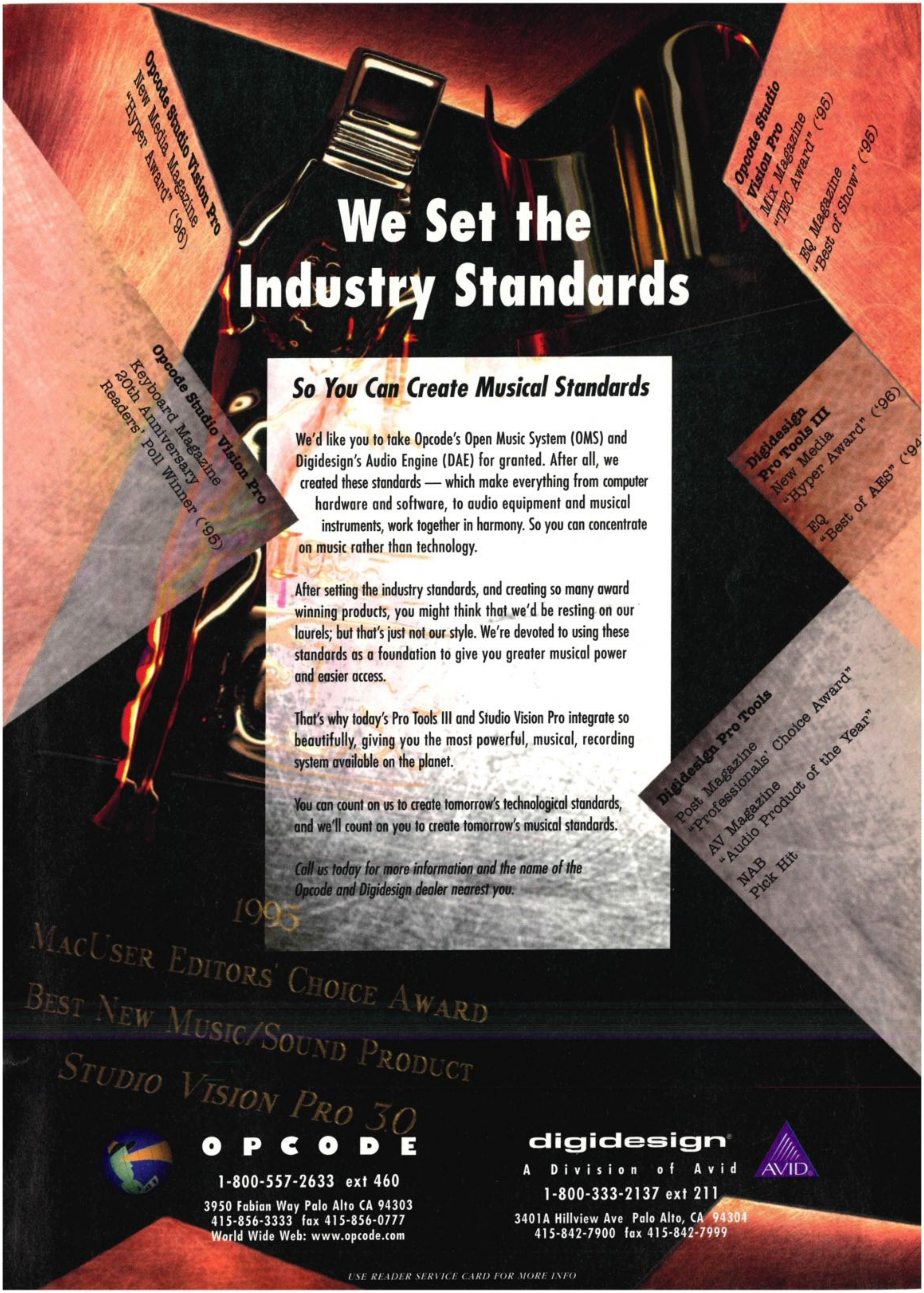
How many Don Gehmans can you spot in this QuickTime VR photo?



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to share the things he has learned along the way. In this case, nice guys do finish first.

Congratulations on the multi-Platinum success of Hootie & The Blowfish. It is amazing the level of success that album has achieved.

Thank you. This has been a wonderful time. I've been enjoying this Number One position.

Do you think that anyone at the label had expectations that this album was going to do anything in the initial planning?

No. There were probably four of us who thought the record had a shot, but certainly nothing like this. We were hoping for a couple of hundred thousand units to start a career. That is all you can ever hope for, really. We thought we had songs that could be hits, but the timing was certainly a big part of it. You just never know.

We were very fortunate in that the label, step by step, became more committed. The band, who are all lovely people to work with, and totally professional, also continued to do every bit of work, promotionally and marketing-wise, that was asked. They were always there and ready to do a good job. It is rare that you get all of those pieces in place. Audiences really like them, too.

Atlantic has been marketing the singles off of this album the same way each time. They start AOR and then they cross over to CHR. They will try a few alternative stations, to see if they will play it, and maybe some Adult Contemporary stations. It's been that kind of a flow.

It's obviously working.

This is as good as it gets. This is every producer's dream—where you get to work with a band that is this successful. The thing that has been so great this time, as opposed to so many others, is that everyone feels like they are part of a team. You have this giant good vibe going on where we had great luck as a team before on that first album. We know that this team is something that works, and we are doing it again for the new album.

How are you going about capturing Hootie in the studio this time around?

It's very much the same style of recording that we had before—the only difference is that we're spending a little bit more time actually performing the songs, because the songs really haven't had much time to be played in yet.

It's the usual sophomore problem of a big record, where the band has been so busy. We went to Bermuda for ten days of writing, and got maybe 25 or 30 things down in a demo form, that were very sketchy. There were hardly any lyrics when we came here. We spent two weeks demo'ing up about 23 songs and finishing the lyrics on all of those. That process of writing and demo'ing took a month.

There are a lot more different kinds of songs this time. We have a section of songs that are "unplugged," for lack of a better word; they're all acoustic. Then there is another section of songs that are really rocking, much more than anything we had before. There is a kind of width to the material. We cut 23 songs. We've overcut by so much that we have the best possible combination of songs that we can hopefully have to get past this sophomore record [jinx] thing.

The A&R guy, Tim Sommer, has been very active with creative ideas. He knows the material as well as anybody and has a real focus on the changes

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that we want to make. He gets cassettes all the time, but he's here for three days out of every week. He always knows the latest versions of what is going on, and is actually in the middle of the process.

This isn't the first time you've worked on an album that has gone through the roof saleswise. You probably experience a strange dynamic of people trying to give you space to work, and at the same time, applying anxious pressure.

There are many people who want to be a part of the process, and that makes it a little more taxing. That's one of the reasons we came up here to record at The Site [a secluded studio in Marin County, California]. We felt we should get out of the middle of the entertainment industry while we record. If people want to hear stuff, they have to come up here to check it out.

So you don't have a problem with people hearing your work in progress? I know some producers refuse to let people come in and hear the evolution of a project, and they won't send out cassettes until the mixes are absolutely done.

I don't have a problem with certain people coming and listening. In fact, I like that. It's a great way to get reactions, so you can see if you are on the mark or not. On the other hand, I don't give anybody copies of anything. I've been very strict. I've always been that way. I don't let people have cassettes of anything, until it is finished. We are basically signing people's lives away, even in the band, to let copies out.

Over the last few years, we've looked for solutions that solved the problems of the cold, thin, bright CD medium. That is why tube gear came back.

I've always been antsy about giving out cassettes of unfinished work.

I think you're taking your life in your hands. It's a chance for someone to make a judgment in a fixed point in time on something that is still a work in progress. For that reason alone, it's a great way to shoot yourself in the foot.

I can't tell you how many managers and A&R guys have come to me over the years and said, "Man, I do this for a living. I know what I am listening for." I tell them, "No you don't. You have no idea what you're doing. The only way that this makes sense is if you are here everyday. Otherwise, it's going to be something that you lock in time. Further on down the road, when I decide that this is the record, and you still have that older mix, you're going to think that your mix is better. That's because you've gotten used to it, and you didn't take the time to listen to the new mix and understand where it is going."

If I give that tape out, I risk having a back-seat driver or producer that I am going to have to deal with for a long time. Many times, it taints the whole project, if that person is in any position of power or has played it for people in positions of power.

What speakers did you use to mix the new Hootie album?

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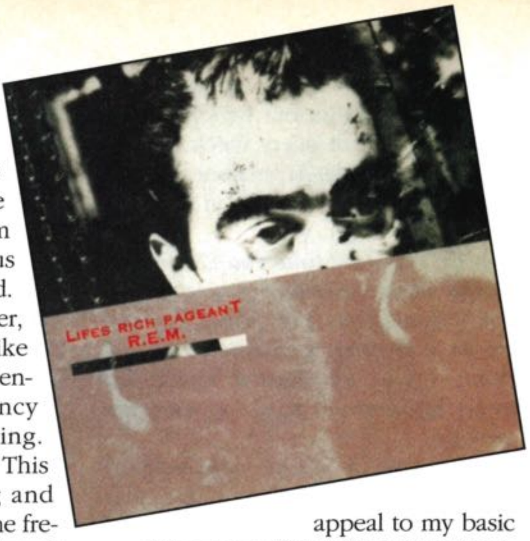

I mixed on these new powered 10-inch Tannoys, AMS-10s. They're self-powered with 400-watt bass and 100-watt tweeter. They are bi-amped and time aligned, and they are brutal. I have never been so close to final results in my life. This happens because I involve my mastering engineer, Eddie Schreyer over at Future Disc, from the beginning of the mix process, instead of afterwards. Eddie and I set up the mix in two different Tannoy-equipped rooms to make sure that the sonic relationship is correct. I basically went into mastering with my mixes on the money. Eddie added 1 dB of compression, and a dB-and-a-half at like 2 kHz to make up for what the compression took away, and that was all. We were done. There were no bottom or top adjustments whatsoever.

I like the fact that the Tannoys are single-point source speakers. They are very phase-coherent—much more so than when you have a woofer and a tweeter separate. The sound is coming out of one point, so the image is going to be right, and you will have an understanding of what is really going on with the balance. These are the most accurate, balanced speakers I've heard yet. That means when I'm mixing, I don't work quite as hard on doing things that are not necessarily right.

I think that is why mastering engineers are trying to adjust balances that were never done correctly. I think that none of us really spends enough time to make sure that we have balances nailed down.

What other new gear have you used recently that has got you excited?

There are several things I've acquired that I feel have made a very significant improvement in my style. I bought a set of Manley Gold Ref microphones, which I'm floored by. I used them for overheads on this Hootie record and a little bit on Tracy Chapman's record, on piano and violin. As far as a currently built tube microphone that does something similar to a C-12 with even more sensitivity—and especially more distance sensitivity—they are just amazing. They still have that really electric, sparkly top end that a C-12 has and a real smooth midrange with no harshness at all.

I've been floored by Manley's new variable MU limiting system. It's a stereo limiter. A lot of mastering people are using them now. As a result, I also like to drive the Manley limiter with an Oram Hi-Def EQ, which has a real sparkly sound that I find desirable. Chris Pelonis turned Eddie and me onto the Oram and Manley gear. Eddie was trying to get me away from depending on the SSL stereo bus limiter, which I have always used.

I've always liked the SSL limiter, but mastering guys just don't like them, because they have a tendency to squeeze up the frequency response and the stereo imaging. The depth kind of goes away. This Manley limiter stereo imaging and placement is totally rock-solid. The frequency response is huge. You hear it limiting, like a Fairchild, but you don't really hear it as anything that you would take out of the circuit, if you know what I mean. It is a very analog type of sound, which is what I like about it. It adds a lot of warmth. When you flip it in, it just gets thick and rich. All of the echoes and stereo still stays together. I used that on Tracy's record.

The making of *Life's Rich Pageant* was a really charmed experience and a great turning point in my career in how to produce records.

Manley has also built this copy of the LA-2A that is really clear and a nice step forward for me from the LA-2A, which was my favorite vocal limiter for years. I had gotten to the point where I was hearing too much distortion from them, so I went to this one and it is much cleaner.

Obviously, what has happened over the last few years is we've looked for solutions that solved the problems of the cold, thin, bright CD medium. That is why tube mics came back. That is why tube gear came back. All of that stuff helps warm up the bottom end, and that definitely translates onto CDs. You can hear tube gear on CDs. It works. These particular companies appeal to my basic philosophy of blending old technology with new. This [makes up for] what digital doesn't bring to the picture.

With your work on Mellencamp, Treat Her Right and other gritty, organic ensembles, has it been frustrating for labels and some critics to peg you as essentially a "rootsy" rock kind of producer? Or is it a natural place for you to be?

It's probably both. I actually enjoy that kind of music, so it isn't a problem. I've always tried to convince people that I can do something else, because I come from these places of, like, working on Bee Gees or Streisand records. It's pretty easy to convince someone that I can do stuff like John Mellencamp. Fortunately, I had that success with the R.E.M. record, *Life's Rich Pageant*. That record opened up a lot of doors for me in the alternative movement, per se. Nobody can deny the granddaddy of alternative music being R.E.M. I did one of their records that most people consider to be among their best. As a result, most of the new bands will at least take a look at me.

I agree that* Life's Rich Pageant *is one of R.E.M.'s best albums.

R.E.M. was the next thing that really hit for me after working with Mellencamp. The making of *Life's Rich Pageant* was a really charmed experience and a great turning point in my career in how to produce records. I think that's when I finally put all the pieces together and relaxed a little. Up until that point, I was certainly subscribing to the "control" producer philosophy, where you have got to comp everything, put everything together, edit it and make sure that it's in time, and all that kind of mentality. R.E.M. showed me that music has a little bit more mystery than that, and I started loosening up and trusting my instincts more.

After your stretch with Mellencamp and R.E.M., you went through a period

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where you sort of dropped out of sight in the Stateside market.

Everybody's career has its ups and downs. I had four or five records with John [Mellencamp] that were all pretty successful. Then we got to a place where we had basically worked together for ten years and enough was enough. I moved on to other things. I had *Life's Rich Pageant* and enough other things that people were looking at me as a record producer. It was no problem getting work, but getting hit records is difficult. You don't have multi-Platinum artists every day.

I started working with an Australian artist named Jimmy Barnes, and that led me into working with quite a few artists in Australia who were successful there. It kind of took up my time from working in the States, so I kind of disappeared [from the U.S. market] for a while. Looking back, I think it was good. It kind of gave me a rest, but when I began trying to work my way back in again, I got the message, 'If you want to try and do any of these bands that will help get you back in the face of America, you need to figure out how to do it for $70,000,' so that's what I did.

When I realized I had to make records for under $100,000, that meant I had to engineer, which meant that I needed to have reliable things around that I was familiar with that I could set up and get good sounds on right away. I now have my own drums, guitars, amps, organs, percussion, and all the stuff needed to record an artist or band. That has been part of my formula, to be a "band in a box" kind of producer. I just roll the stuff in and set it up. 'Bring your guitars and plug in,' you know. This way I can basically take an artist who has a great song and make sure that I have great sounds. It makes it easy for me to get something quickly that will work. If I need a great acoustic guitar sound, I've got one that I know will record well. The same goes for drums, bass, amps. I also own a lot of old gear, like vintage microphones, Fairchild limiters and API equalizers. I also bought a lot of instruments, too.

Did Hootie & The Blowfish's debut fall into this under- $100,000 budget category?

Yeah. It was $75,000. When you go in for like under a hundred grand, a label will take another chance on another hundred thousand with the project. I don't think anybody is really hurting to spend two hundred and fifty grand on a project that they sign. I think it hurts when they spend a half a million and lose. I think a gamble of two hundred and fifty grand is something most labels are willing to take, if they can get their video, promotion and marketing all in place.

This is one project that has recouped handsomely with this stripped-down philosophy.

Oh, yes! [Laughs] It's a great study in how to make it work and get everybody on it. I spent about 28 days on it—20 days of recording and eight days of mixing. It took me about six weeks, because I work five-day weeks. The band already had about a 30,000-unit base in Columbia, South Carolina, and several other towns in that area.

Atlantic is a very pragmatic company. They are going to follow whatever looks like it's working. Hootie obviously worked in their hometown, so Atlantic followed through and they tried out one more market. They followed it there and then tried another market and followed it there. They just built it up like that, block by block.

Your recent production of Tracy Chapman's latest offering,* New Beginnings, *is doing quite well.

It's a record that you put on and it "plays" behind what is going on in your life, and somehow, it gets in your blood. I can't explain it any other way. I see other people reacting to it in the same way. I put it on and they enjoy the hour of music that is there. It isn't like they put the album on to just hear a song. They put it on for an experience, and her ideas, which are gradually sifted into you through osmosis. It's the only record that I've done that really does that, and that's what I really enjoy about it. What I added was a production concept that actually made it soothing and warm, and it's still a live band.

Tell me about The Site, where you recorded the latest Tracy Chapman and Hootie albums.

It's beautiful. Both bands loved it as an environment. You're seven miles from civilization, and it has wonderful views and incredible food. The actual studio itself is "A" class, and it has as good a signal chain as any I have ever heard. They have a huge Neve 8078 that they built themselves out of about three consoles. The facility is well-maintained and they have an on-site maintenance person all day, which is rare for a one-room facility. They also have a full-time assistant named Kevin Scott, who is amazing.

What would you say is the sign of a good assistant?

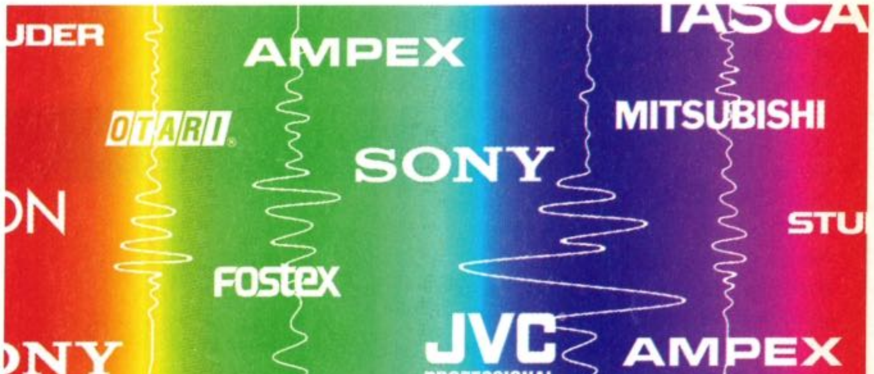
When I was coming up as an engineer, we were always told that we were supposed to guess what the next move was, and be set up for it, before we went there. Sometimes that means doing two or three things at once, but that's the mark of a good assistant.

Have you thought about taking an extended vacation, after all of this Hootie success?

I could, but no way! Would you? [Laughs] You work hard to get into this spot, to where you get a choice on what to work on and maybe get one other thing that might have a career.

I was talking to Ron Albert yesterday. We worked together at Criteria. We were talking about how you hope every record you make is great, but great is just not good enough to guarantee success. There is a huge quotient of luck sitting on top of that, in terms of whether something is successful. Nevertheless, you won't get a shot unless you set out to make great records. ■

Rick Clark is a Memphis-based songwriter, musician and producer.



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BY PHILIP DE LANCIE

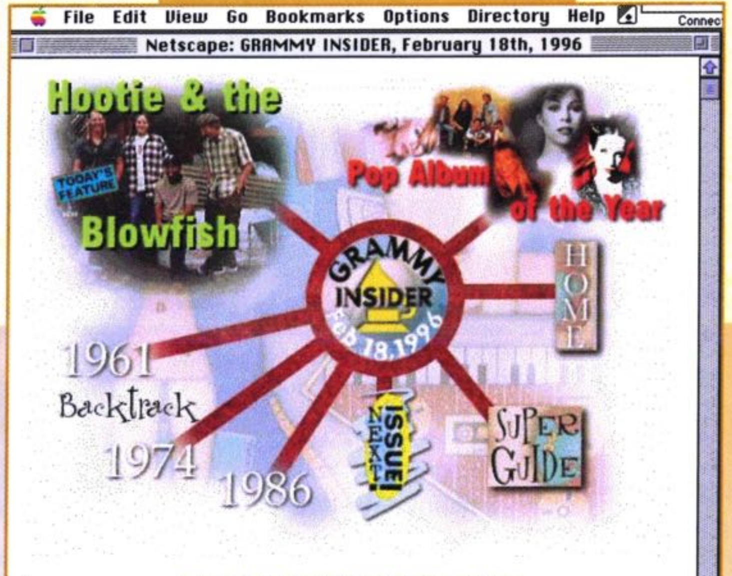
NARAS, APPLE AND INTERCAST TEAM UP FOR AWARDS SHOW WEBCAST

As the Internet has expanded beyond the realm of government and academia, music has become one of the most popular Internet subject areas. At the same time, the availability of real-time audio playback on the World Wide Web using systems such as RealAudio and Stream Works (both covered in this space last issue) has made "Webcasting" one of the hottest new ways to use the Web. These two trends converged around the 38th annual Grammy Awards, which were not only televised as usual but were also covered on the Internet, with a home page at grammy.apple.com. that has remained available for exploration months after the real event at Los Angeles' Shrine Auditorium was over.

Expanding the depth of Grammy coverage—and allowing the public a glimpse of many Grammy-related events that never make it into the telecast—was largely the idea of Chris Andrews, whose Palo Alto, California, media production company, UniDisc, has been closely associated over the years with NARAS, the organization that presents the Grammys. Andrews produced a number of NARAS-related CD-ROM projects and recently formed a second company, Intercast, to focus on producing Internet events. Andrews got NARAS together with Apple Computer, and the Grammy Awards on the Internet was born. At the time of this interview, Andrews was preparing to jump a jet to Los Angeles to begin final setup for the event.

What are the various components that make up the Grammy Awards on the Internet?

The Grammy Awards on the Internet is a co-production of NARAS, Intercast and Apple Computer. The three organizations have signed an agreement to produce an integrated production, which will be at grammy.apple.com, for at least a month after the Awards, probably several months. It has two phases: The first phase is called the Grammy Insider. That is a daily "publication" going from February 15-28 with things like interviews with artists, background on the Grammy Awards, and "Backtrack," which takes each year the awards have been around and talks about that year as it relates to music. There will also be a section of the site called Tools that will allow you to download RealAudio and QuickTime VR and a bunch of other helper applications and technologies that you will need for the second phase, which is the live on-site production that Apple is calling QuickTime Live. But you don't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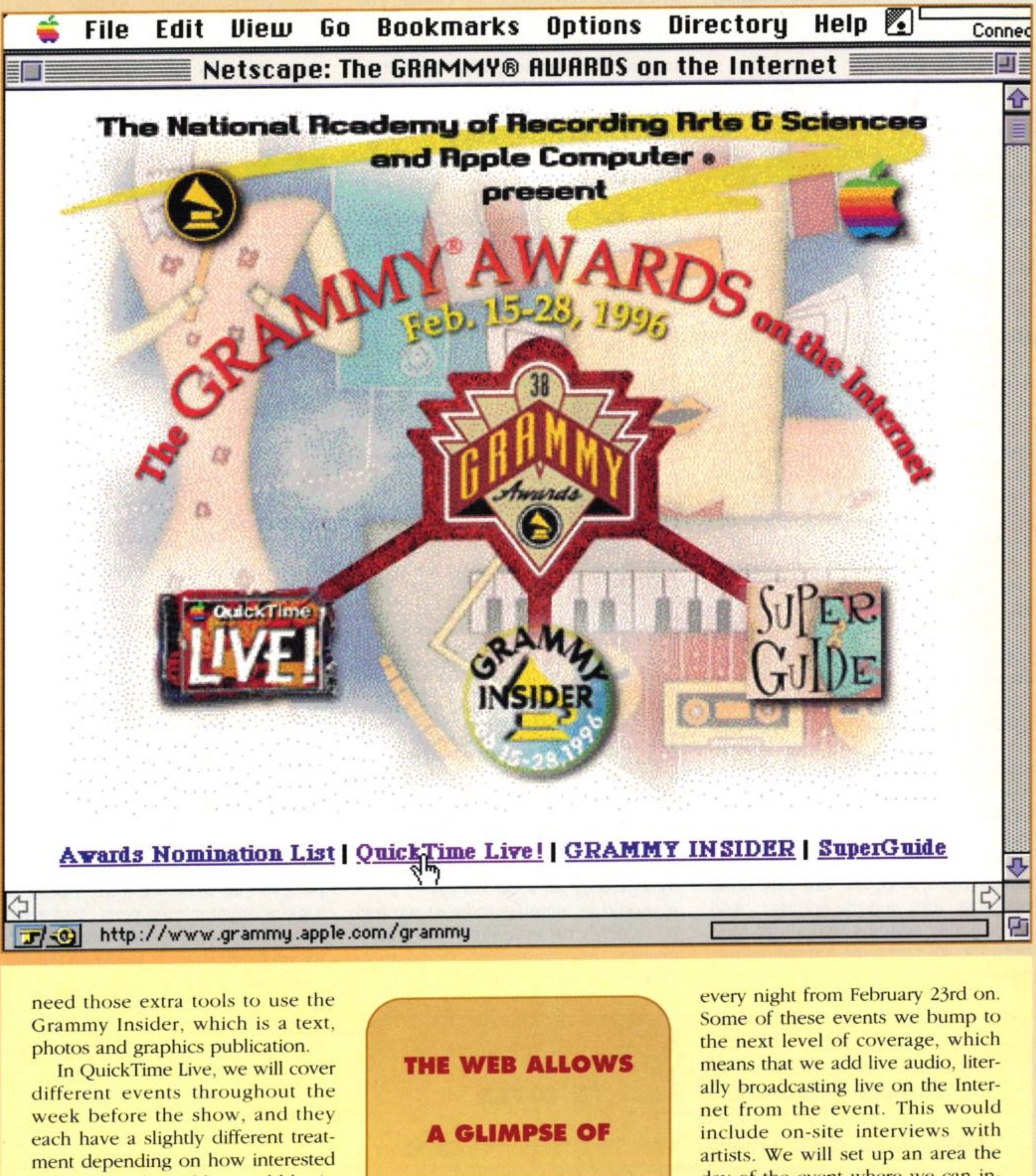
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need those extra tools to use the Grammy Insider, which is a text, photos and graphics publication.

In QuickTime Live, we will cover different events throughout the week before the show, and they each have a slightly different treatment depending on how interested we thought the public would be in what was being offered. The simplest treatment is a "roving reporter," one or two people with a QuickTake digital camera. They write about and take photos of particular events. We will be doing that at a lot of the Grammy events. For instance, there is a Hall of Fame event, a Quincy Jones benefit, and a number of other things just about every night from February 23rd on. Some of these events we bump to the next level of coverage, which means that we add live audio, literally broadcasting live on the Internet from the event. This would include on-site interviews with artists. We will set up an area the day of the event where we can interview people. One of the nice advantages of streaming audio, such as with RealAudio, which we are using for this particular production, is that it can be listened to live or it can also be available for listening later on.

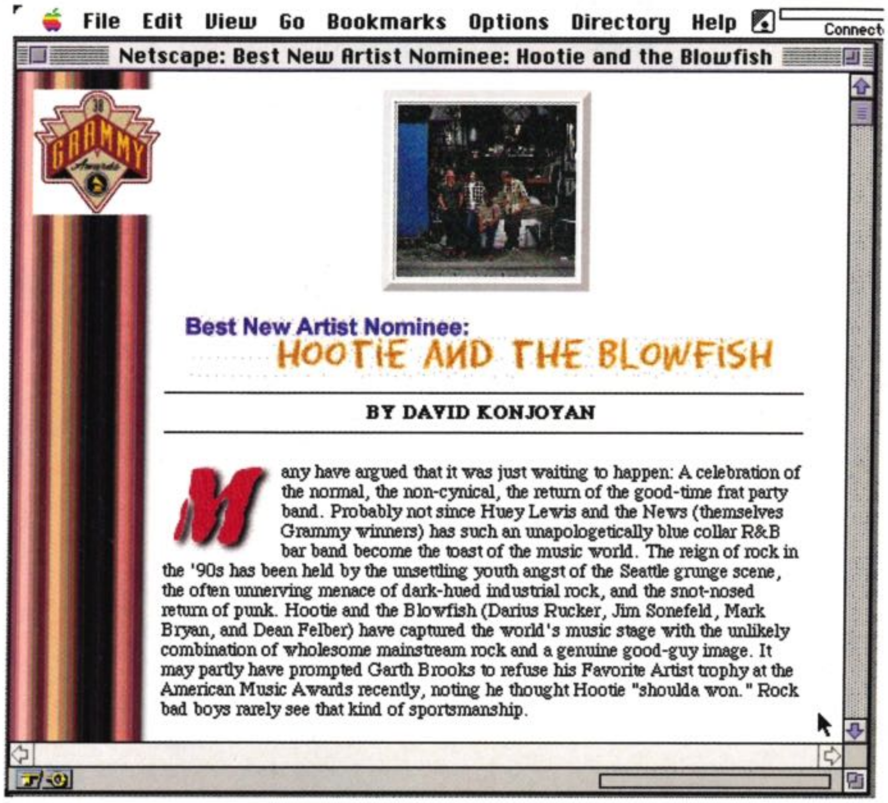
THE WEB ALLOWS A GLIMPSE OF MANY GRAMMY-RELATED EVENTS NEVER TELECAST.

There is also a section we call the Super Guide, sort of a combination of a schedule and a table of contents, which helps tie the Grammy Insider and the QuickTime Live parts together. You can look at the content by artist, by event, etc.

What are some examples of the events you will cover live, and how will you cover them?

Three key events will get full treatment: there will be a reporter/photographer, we will shoot some video, and we will broadcast live audio. One is a Carlos Santana benefit concert for the NARAS Foundation at the Universal Amphitheater, which is also part of honoring Carlos Santana into the Hollywood Rock Walk. We are planning on live Webcast of the audio from that concert. Another key event is the Grammy Showcase, which is sort of like Grammys for unsigned bands. They had 3,500 bands enter the competition, and they ended up with four bands who will be playing a concert from the Palace, and we are covering that in two ways: On the Grammy Insider we are covering it with profiles on those artists, and we are also covering it live.

Probably the most exciting and complex part of the event is backstage during the Awards show itself. We will have our own area at the Shrine that the artists and presenters and performers will stop by to get their photo taken and say a little something for the Internet. We will also have a number of different cameras around the Shrine, video cameras that will be generating stills at a rate of about a frame every minute or so, so people can look at the backstage area and the entrance. And we are also taking a live audio feed from the TV and radio interview area, where the artists go to get interviewed after they have won an award. The challenge will be to integrate this whole series of things, and to make it easy for the users to get at, because we will have so much happening at particular peak times.



Netscape: Best New Artist Nominee: Hootie and the Blowfish

Best New Artist Nominee:

HOOTIE AND THE BLOWFISH

BY DAVID KONJOYAN

Many have argued that it was just waiting to happen: A celebration of the normal, the non-cynical, the return of the good-time frat party band. Probably not since Huey Lewis and the News (themselves Grammy winners) has such an unapologetically blue collar R&B bar band become the toast of the music world. The reign of rock in the '90s has been held by the unsettling youth angst of the Seattle grunge scene, the often unnerving menace of dark-hued industrial rock, and the snot-nosed return of punk. Hootie and the Blowfish (Darius Rucker, Jim Sonefeld, Mark Bryan, and Dean Felber) have captured the world's music stage with the unlikely combination of wholesome mainstream rock and a genuine good-guy image. It may partly have prompted Garth Brooks to refuse his Favorite Artist trophy at the American Music Awards recently, noting he thought Hootie "shoulda won." Rock bad boys rarely see that kind of sportsmanship.

What is it about the Internet coverage that adds interest and value compared to the coverage most people get by watching the show on TV?

It should be emphasized that we feel it is a noble cause to break some new ground. At a minimum, there are a number of things that you won't see through traditional coverage, and if they were covered, they wouldn't be covered the way we are going to cover them, because we have an entirely different approach from TV or radio. People will be able to see a lot of behind-the-scenes-type things—interviews with artists, rehearsals—and we will be covering it in a way that people can go back and choose to look at anytime they want, and it will have a combination of editorial, photos and audio. So it is really an attempt to carve out a niche for this medium as being able to offer not just one highly produced stream of an event—like television—but a number of what I call "slightly produced" streams for people with different interests.

THIS MEDIUM IS ABLE TO OFFER NOT JUST ONE HIGHLY PRODUCED STREAM OF AN EVENT—LIKE TELEVISION—BUT A NUMBER OF WHAT I CALL "SLIGHTLY PRODUCED" STREAMS FOR PEOPLE WITH DIFFERENT INTERESTS.

—CHRIS ANDREWS

The goal for me is to make some kind of contribution for people who don't necessarily want to sit at that moment in time and watch TV, but want to go into another level of depth and interaction with the event. So instead of the three hours of TV—which is a great show that a billion people will see—our focus is a week-long series of events that culminates with that particular show.

Current Internet technology doesn't support live transmission of any kind of watchable motion video. Given that fact, do you suspect that people who have a choice during the Awards cere-

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mony between visiting the site or just turning on the TV will find the TV coverage more involving and engaging?

I don't see what we are doing as being in competition with the TV broadcast. But the closest we come to Internet video is that on the day of the show, people with ISDN lines will be able to use Apple's QuickTime Conferencing to get video by Internet standards, which is a frame every number of seconds. I'm not emphasizing it, because it will be a cutting-edge kind of thing. We are a year or two away from being able to do any decent frame rate in video. But there will be a helper application available for download from the Website to decompress the QuickTime Conferencing video.

What was the genesis of this idea, and how is the whole thing coming together?

This is an expansion of a relationship that I have had with NARAS since about 1990. I have been involved with every new media project that the Grammy Awards have been involved with, including a number of CD-ROMs. We started working on the idea about six months ago. I went out seeking a partner—a little bit on NARAS' behalf and a little bit with an entrepreneurial spirit. I interviewed about 15 companies, big and small, and Apple scored very high, largely because of their QuickTime Live team. Things really started coming to a boil in December when we felt we had to make a decision, and that is when we got into a lot of intensive talks with Apple, because we wanted to know who our partner was by the time of the Grammy nominations on January 4. Satjiv Chahil, Apple's VP of marketing, personally helped to pull this together, so it has a high level of support from Apple, which was important for everybody.

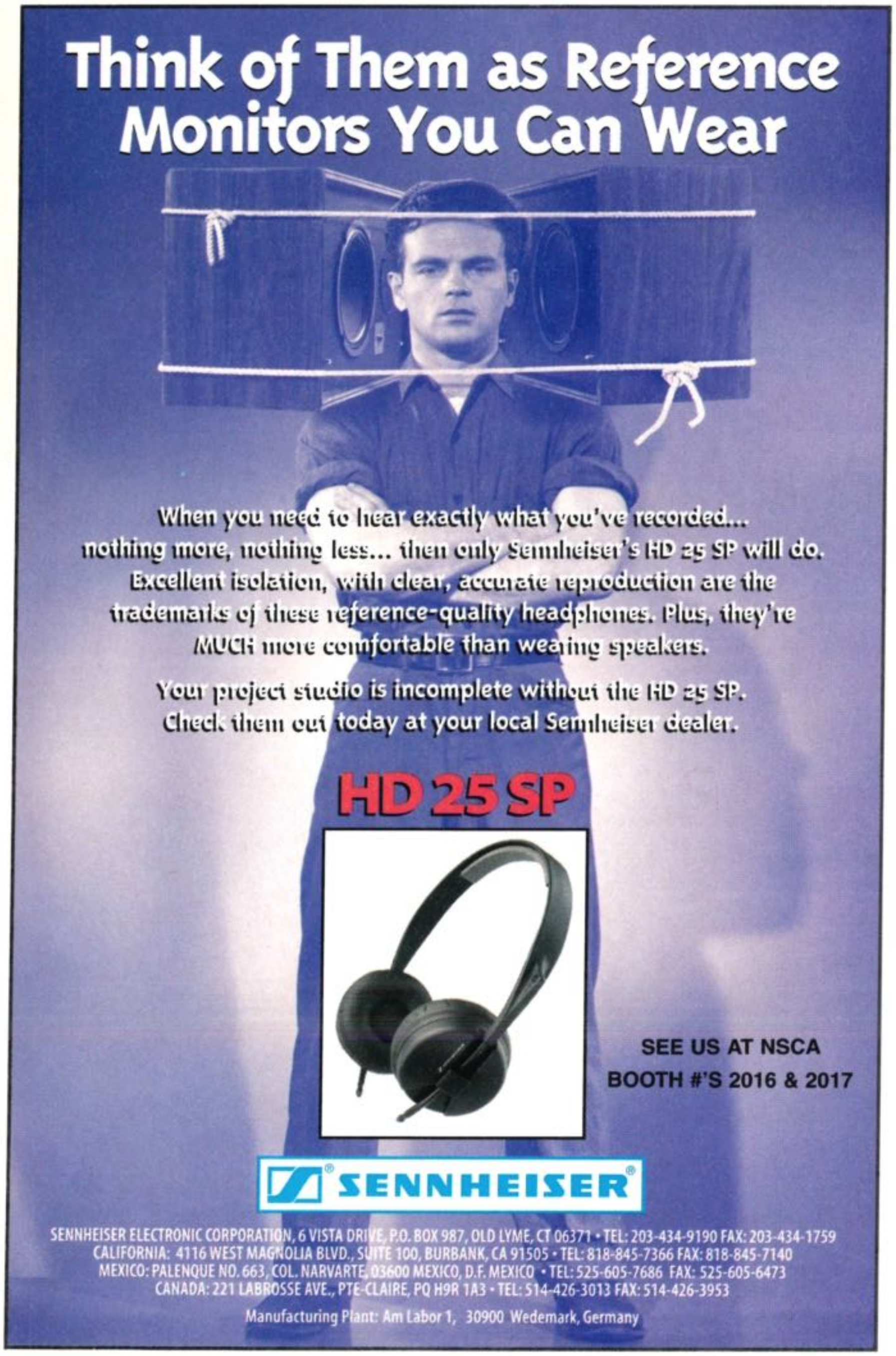
How would you define the different roles that Intercast and Apple are each playing in the production?

Myself and Rob Senn, the general manager of NARAS, are the executive producers of the whole Internet event. Intercast is officially the managing production company, but it is really more of a co-production with Apple. What I do and what Apple does are very complementary. They are really on the technology side, and I am more on the creative side, working with the writers, the artists and the photographers. I come up with concepts and coordinate the execution, but on the live part of it, the Apple producers will have a lot of creative license.

The real Apple emphasis is on the live events. QuickTime Live is more than just a technology. Apple is really looking at it as a name for a live Webcast: the technology, the people, the process. It is a QuickTime Live production. I looked at a lot of companies, and Apple was the only one that actually had a team to do this. Right now, there aren't a lot of people with the skills to do live Internet broadcasting except for within Apple or the other companies that have the technology. Approximately 30 people from Apple will be involved. They are providing the hardware and software behind this, and the Website is an Apple server.

How will the whole production process work for the live events?

We are breaking a lot of new ground, so we are spending a lot of time in meetings trying to determine how to really do a live event on the Internet. First of all there are a lot of specialists on the team—audio, cameras, writer, photographer—and it looks very much like a live television crew, but we don't have the remote vs. back-home partition yet. In other words, we can't just send a reporter and a producer out to a site. We might need to send out equipment and engineers to the site in order to do a production. For instance, we have to bring 25 to 30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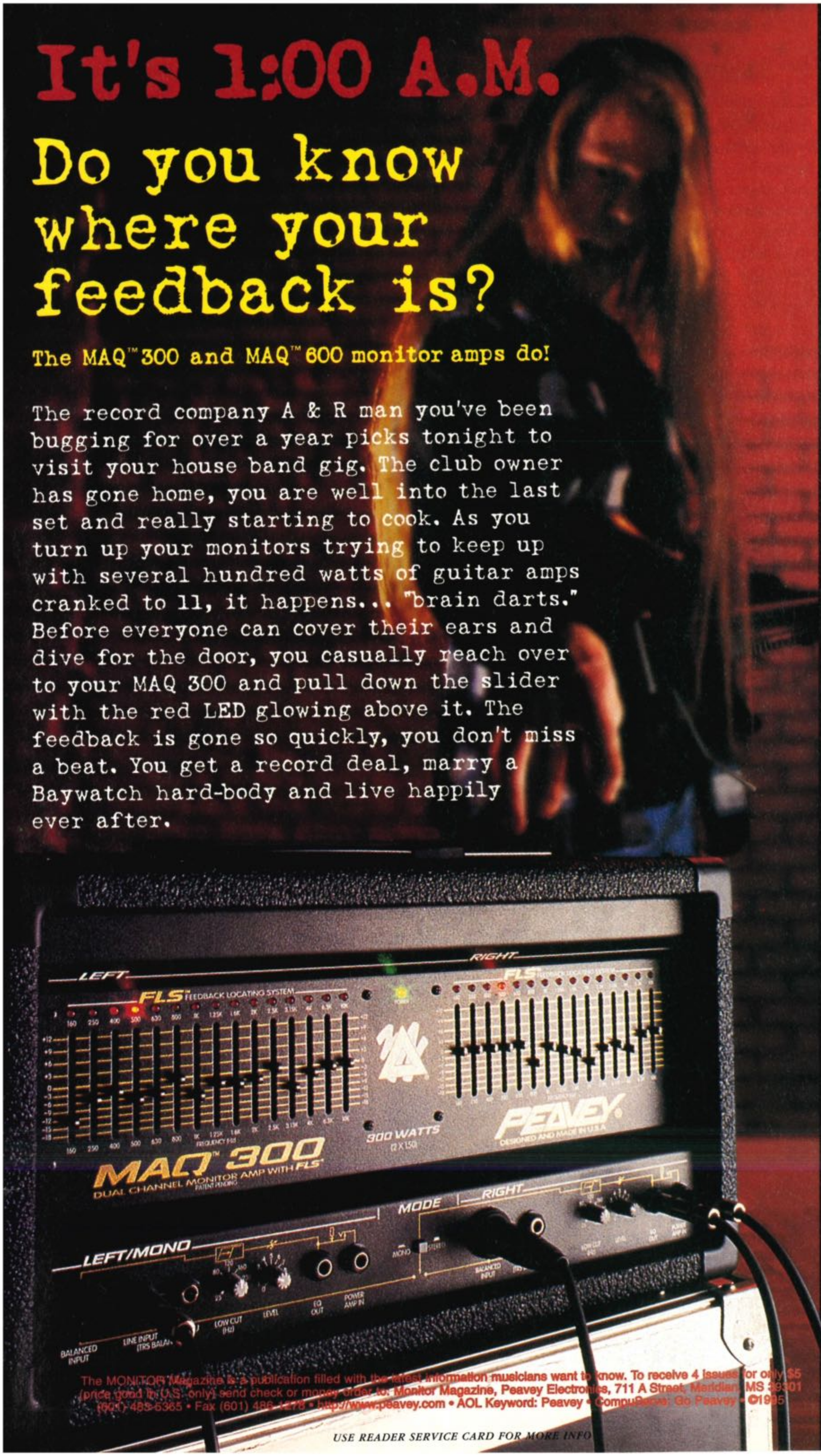

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people down to the Shrine for nine days to do this.

The way the process works is that we start by looking at what a good creative concept is for the screen, and then we work back from that. Take the example of the artist who just won an award and will stop by our production area in five minutes. What do we do with those five minutes? We had to map it out, and we decided that we have a predesigned graphic displaying that artist as the winner, and a writer who knows the industry very well who can comment on the significance of that person winning. So when the person comes to our area, we have everything except their live photo, and maybe something for them to say. They come in, we take a digital photo to post to the site, and we take a quote from them, which is typed in at that moment as a caption on their photo. So then we have a nice package that is the first time after their speech on television that there is something about them "in print."

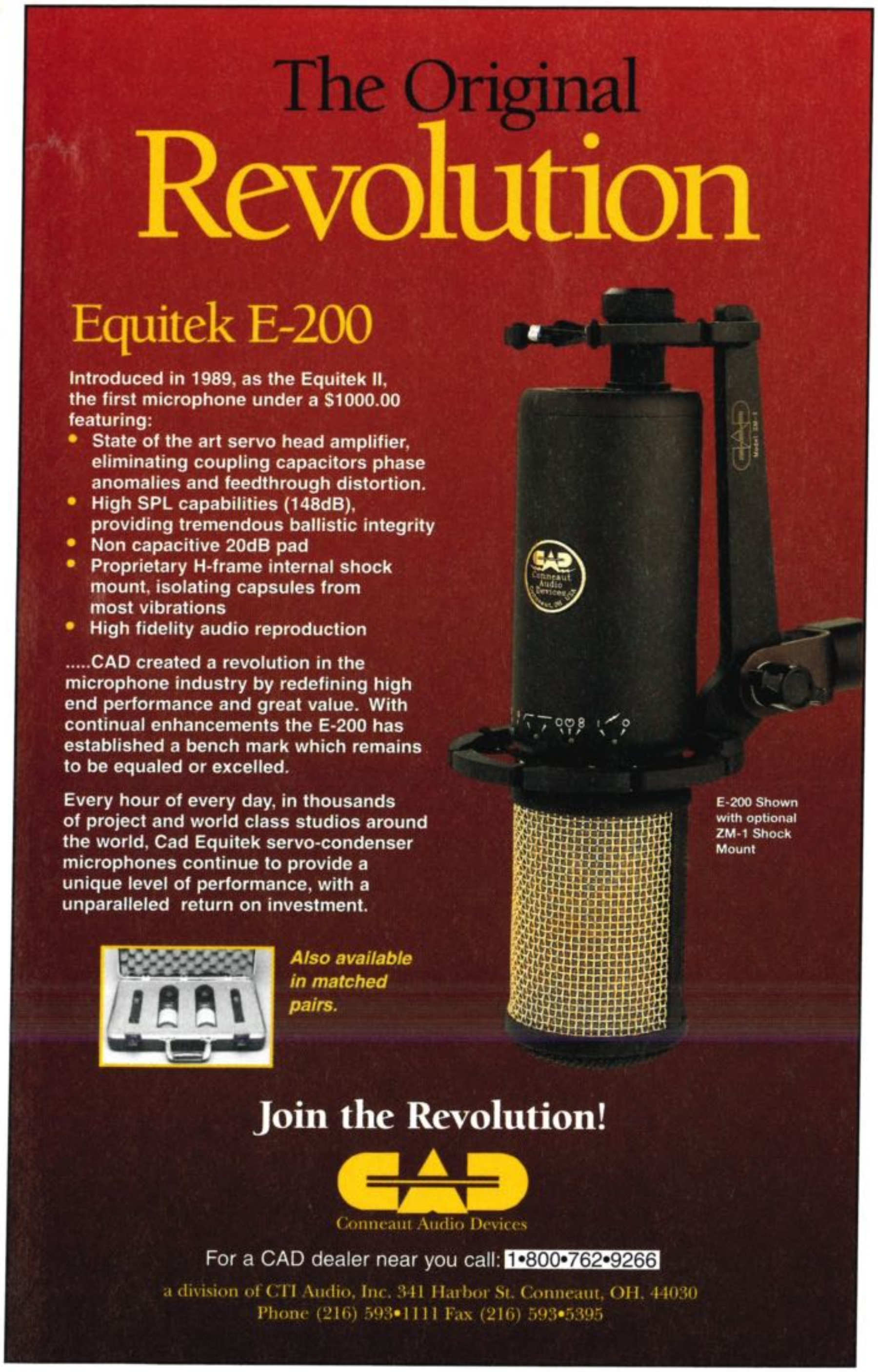
That is one example of maybe a dozen or two dozen specific processes—a combination of a high-tech engineering process and a creative process—that we have had to map out very carefully. There are 90 awards over a six-hour period, because we are covering the "pre-tel," the 60 awards or so prior to the live broadcast. In that particular process you have about seven or eight people working from start to finish. You have the writer, you have someone who knows the technical layout on the Internet, you have the editor who proofs it all, you have someone who posts the content to the main site, someone who takes the photo and dumps it into the computer. So half the team for a given process may be high-tech and the other half creative.

I would say that the production shop at the Shrine will not be that different from the art and editorial departments at a magazine publishing company. That is the way I look at it. It just happens a lot faster. Even the audio portion goes through a process of compression and testing, so there is still the element of material sitting in the computer for some time, even if that time is minute. It all has to flow with the rest of the production, so there are certain characteristics that are closer to radio, but there is a director at that moment, who has to know what is going on not only with live audio but with graphics and canned audio segments. When I observed the QuickTime Live team at the San Francisco New Year's Eve event, there were a number of different work stations with signs like "Audio Production" and "Webmaster" and "Reporting."

How does the live audio feed integrate into the overall production process?

The audio station will look from the outside just like any of the other stations, and it will have some cabling to the audio pool for the TV and radio feed. But the biggest challenge isn't in the production of the audio but in the delivery, accommodating a lot of people listening at one time. That is difficult because they are all using the available bandwidth at the same time, as opposed to when they download audio or click on audio, listen to it, and then go do something else. We want to make sure that there are enough audio streams—thousands, I would say—which means a lot of RealAudio servers. Apple has contracted with a local company in Santa Monica to be able to accommodate that. The feed will go through Real Audio compression at the Shrine, and then go out to the servers in Santa Monica over a T1 line. ■

Mix*'s media & mastering editor, Phil De Lancie, is a mastering engineer and multimedia designer for Fantasy Records in Berkeley, Calif.*



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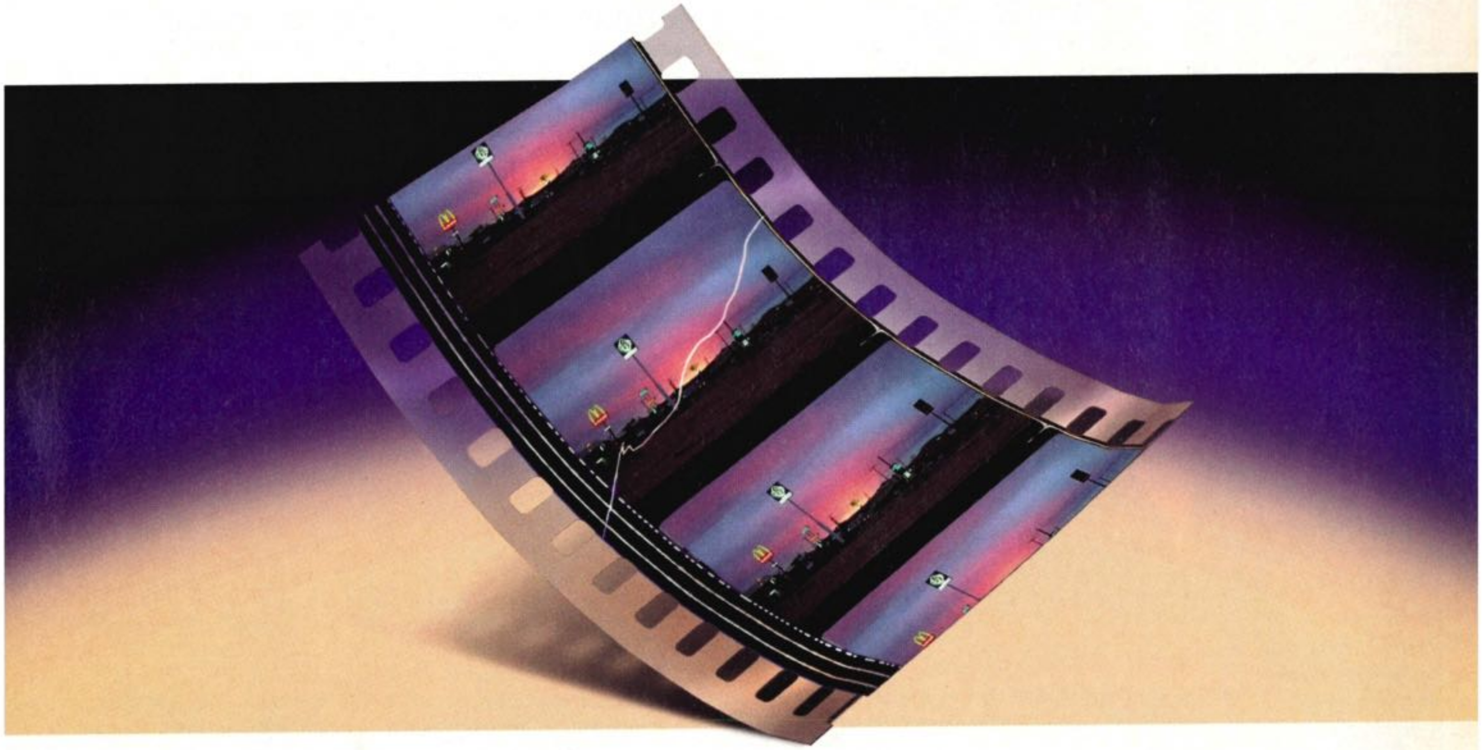

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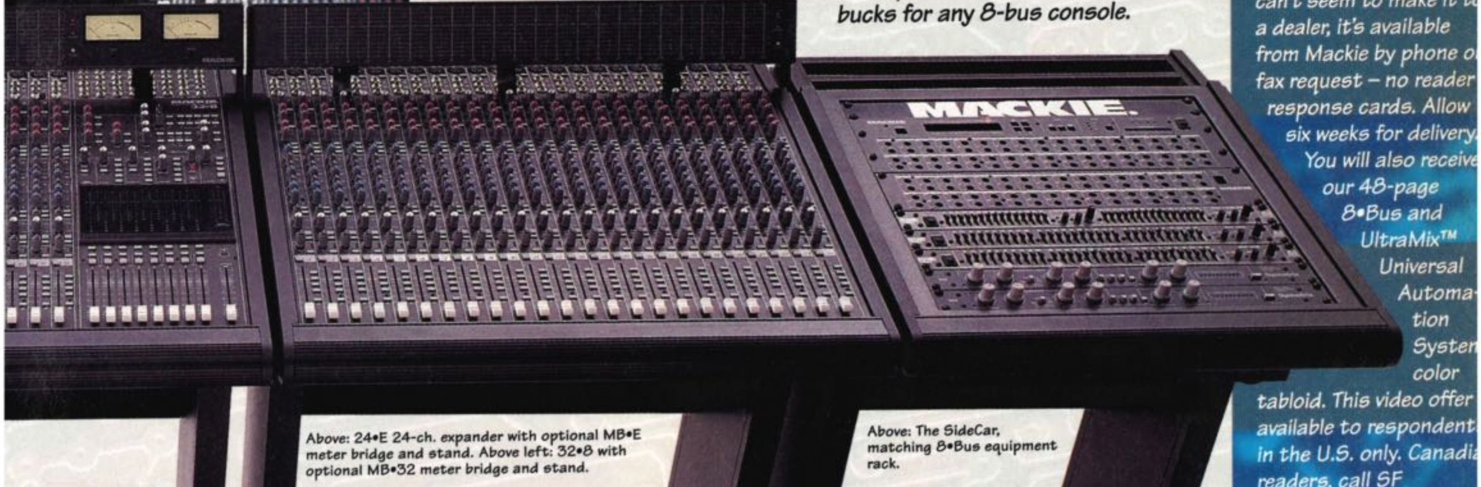

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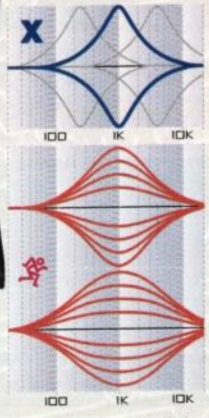

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Clockwise from top left: Jarvis Cocker of Pulp, Michael Jackson, Brian Eno and RadioHead, David Bowie and the Pet Shop Boys. Background photo: Simply Red onstage live at the The Brit Awards. Background photo: Dave Hogan

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THE BRIT AWARDS

SOUND REINFORCEMENT, BROADCAST AND POST FOR THE KING OF POP'S NIGHT WITH PULP

BY ZENON SCHOEPE

PHOTO: CHRIS TAYLOR

The Brit Awards show has something of an identity crisis. It presents itself as the definitive British music awards ceremony, but much of the British public doesn't see it like that or appreciate it as such. This perception is partly due to the fact that the British don't actually like awards ceremonies—the gut reaction tends to be one of revulsion that prime-time TV should indulge the choice and influence of a few and then celebrate it so lavishly. The Brit Awards have even been compared in significance in the past to the reviled Eurovision Song Contest—that annual atrocity that proves, if proof were needed, that the Europeans can sink as low as anyone in the name of music entertainment.

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This year's Brits, held at Earls Court rather than the smaller Alexander Palace venue used in previous years, was definitely better than past attempts, and the television coverage that most saw was certainly improved. Credibility—or sell-out—was enhanced by the presence of Michael Jackson, whose "live" performance was prefaced by an incongruous video montage portraying the artist as the "King of Pop."

The highlight of the show for those who attended was undoubtedly an incident that occurred during Jackson's full-length rendition of "Earth Song," which he performed on a pyramid set complete with moaning, clawing, miming and seriously overacting post-environmental-disaster extras. The song climaxed with Jackson stripping down to an all-white costume and adopting a Jesus-like pose as he welcomed the now gratefully smiling extras into what could only be supposed to symbolize the bright light of heaven behind him. Most surprising was the unexpected appearance of a heavily stylized Hassidic Jewish gentleman, whom Jackson kissed on the forehead—there was some sort of symbolism at work here, and minds raced in incredulity to make a connection. Jackson then treated us to some environmental and social statistics and told us that he loved us. The set finished with Jackson turning and walking into the bright light, surrounded by small children and with his hands outstretched, the middle and index fingers of each hand extended. If this is show biz, then John Paul II ought to look out because somebody is after his job.

But wait, there's more! During the performance Jarvis Cocker, lead singer with British band Pulp, was so overwhelmed with indignation at the pomposity and bogus sentiments of the spectacle that he darted onto the stage, allegedly flicking V-signs in the general direction of the King of Pop as he went (the two-fingered V-sign is the British equivalent of the American middle-finger gesture). He was pursued by security guards, resulting in a scene that was described by those who witnessed it as similar to a Marx Brothers movie.

Cocker was caught and spent the remainder of the evening and some of the morning as a guest of Her Majesty's Constabulary, supposedly because some of the extras had been ruffled during the chase. Most of the evidence of this occurrence was cut from the TV coverage of the show that went out the following night. Jackson later issued a statement saying he was "sickened, saddened, shocked, upset, cheated, angry but immensely proud that the cast remained professional and the show went on." In his own statement, Cocker said: "My actions were a form of protest at the way Michael Jackson sees himself as some Christ-like figure with the power of healing. I just could not go along with it anymore."

Cocker was not without sympathizers. Record producer Brian Eno, who won the Producer Award, told BBC television news that he wished he'd protested himself and said that Cocker's actions were as if to say "This is such rubbish, please let's not stand for this." Maybe Jackson should have come on and sang "Rockin' Robin" and none of this would have happened. However, happen it did, and it did no harm to the TV ratings, which topped 11.7 million on ITV in the UK. The show, which was broadcast live on Radio One, is expected finally to reach audiences in 133 countries when syndication is complete.

JARVIS COCKER, LEAD SINGER WITH BRITISH BAND PULP, DARTED ONTO THE STAGE, ALLEGEDLY FLICKING V-SIGNS IN THE GENERAL DIRECTION OF THE KING OF POP.

Band-of-the-moment Oasis bagged Best Band, Video and Album awards. Best single went to "Back for Good" from Take That, who recently announced, after much speculation, that they were breaking up. There were also live performances from Simply Red, Alanis Morissette, Pulp and David Bowie, who received a Lifetime Achievement award. Michael Jackson won an Artist of a Generation award, and although the whole show was cut back severely for broadcast, his acceptance speech was included unedited in all its long, paused and nervous splendor.

SOUND REINFORCEMENT

It was a big production for a Brit Awards show. Three thousand three-course meals were served in an hour and a half by 700 catering staff and 50 chefs, and the move to Earls Court added a sense of scale and urgency to

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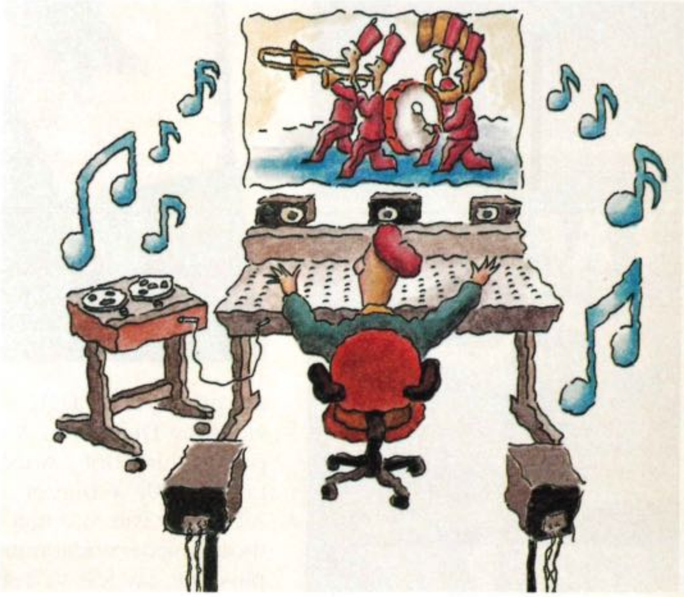

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Michael Jackson live onstage at The Brit Awards

PHOTO: DAVE HOGAN

the proceedings. FOH sound was provided by Dimension Audio (the company's third Brit Awards), who were faced with a bigger stage than at Alexander Palace, a much shallower although wider auditorium arrangement, plus one day less to install. Stage construction fell behind, and sound checks were made while building continued on Sunday for the Monday evening event. Derek Zieba, director and general manager at Dimension Audio, says the schedule and the echo-y acoustics of Earls Court's large hall had the makings of "a wee bit of a nightmare.

"The big problem for me was that there wasn't any acoustic baffling at all, which is traditional when you do a rock show in Earls Court," Zieba explains. "We had to fly everything and get it well-angled down at the audience, and if we let the levels go overboard the second and third reflections coming back would have been very apparent on the broadcast." Dimension Audio's own Turbosound Flashlight and Floodlight systems were spaced in what was in principle an LCR flown arrangement. "Clearly with the environment they'd created there really wasn't the place for any stacks, so we ended up with a 16-cabinet cluster of Flashlight mid-tops in the center, two nine-way clusters of Floodlight at the sides, with the bass bins stacked as columns either side of the stage behind masking," Zieba says. "We would have been helped if there had been a position for bass bins somewhere in the center because it tended to get a bit bass light."

While the artists and the heads of the industry sat at the back of the auditorium, around 400 screaming Take That and Michael Jackson fans were placed in a pit area in front of the stage, where their audio needs were served by Meyer UPA front fills.

"We had three FOH boards—two Yamaha PM4000s and one PM3000," Zieba says. One of the PM4000s was dedicated to Simply Red, the other coped with David Bowie and Pulp, and the PM3000 handled Alanis Morissette and "all of the other stuff to do with the awards ceremony—like DAT playback, walk-up stings, VT support and podium mics.

"We had three monitor desks backstage—two Midas XL3s and a Soundcraft SM16, which was a late addition because we got line lists quite late from all the bands, and it was clear that it would be a nightmare reset," Zieba adds. Sidefills were flown Floodlights for up-stage and down-stage positions to cover Simply Red's staircase set and Michael Jackson's pyramid set. The remainder of the monitoring system was standard bi-amped 2x12 and 15-inch boxes with a fair smattering of in-ear monitoring and radios.

In a departure from previous years, most of the bands brought their own engineers for FOH and monitors. (The two acts that didn't have FOH engineers were Take That and Michael Jackson, whom Zieba handled. In Take That's case, it was vocals to DAT playback, and in Jackson's case, just DAT playback apart from his narrative at the end of his performance.) Zieba believes this is the right way to do it.

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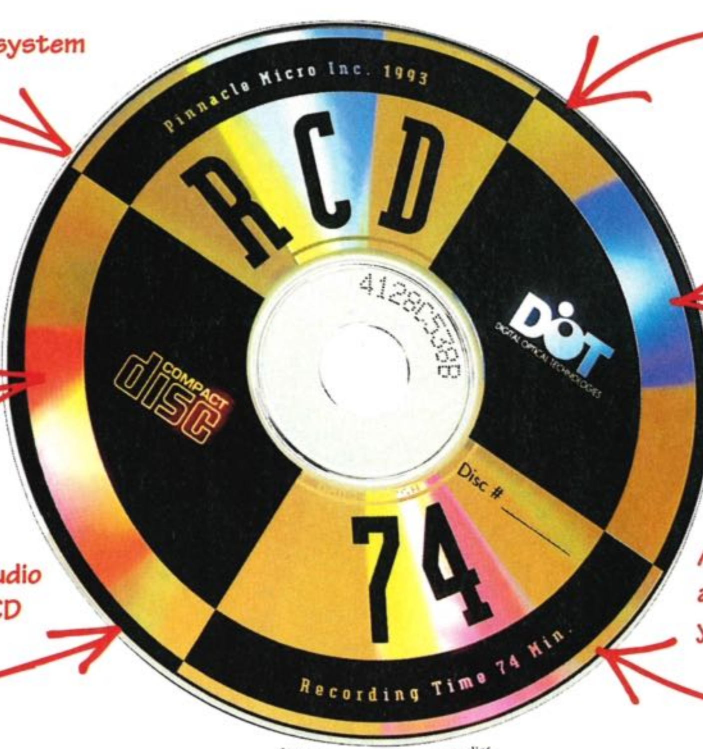

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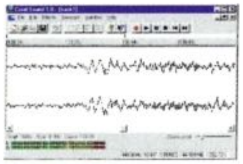

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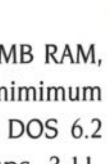

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check, and it's in front of all the music biz so they want to get it absolutely right. The quickest way to do that is bring in their tour engineers," Zieba says. "The band sound was actually very good, and we achieved the sort of levels they wanted, taking onboard that it was a show for TV and if we went mad on the FOH P.A. you'd get coloration [in the broadcast sound]. The levels were perhaps less than you would normally achieve at a concert, but it was still pretty punchy stuff." According to Zieba, it was the podium mics that posed the greatest problems, due to the variety of different mic techniques displayed by award presenters and recipients. Presenter Tina Turner grabbed one of the AKG 747s at the podium and hollered down it as only Tina can. "Yes, she gave it loads," laughs Zieba. "I was catching cones at the back there."

BROADCAST

Toby Alington, who specializes in music gigs for TV and live concerts, was sound supervisor in charge of all the broadcast sound. The performances were recorded to 32-track Mitsubishi digital with both a main and a backup running in two trucks from The Manor Mobiles. All the broadcast feeds were split from the onstage sources, with additional mics placed for audience pick up, for a total of 172 mic lines. Alington split the recording duties with Manor Mobiles' Will Shapland, and taped the appearances of Simply Red, Take That and Michael Jackson at Manor's newly refitted 48-channel SSL E Series; the other bands were recorded through the second Manor truck's 72-channel Raindirk. A total of 22 audience mics were employed, with the adoring pit area served by Crown cardioid PZMs placed around the front of both stages, all mixed down through the Manor SSL truck's 24-channels of API with remote mic amps.

Cameras for event producer Initial TV were provided by Chrysalis, whose Dave Taylor oversaw the mix-to-picture in the Chrysalis truck. Taylor recorded the stereo feeds from each truck plus the stereo audience mix and the presenters' mics on 16 tracks of DA-88, with safety copies on analog Beta SPs. For the final dub to picture, the producers relied on Taylor's mix as much as they could, although some of the presenter "overloads" had to be remixed.

A hard disk system was used for the walk-on and walk-off music. "We used a (SAV) SADiE in the SSL truck for the playbacks, which is excellent for rehearsals because it's instant cue up, and if they suddenly want clicks on the front it's a doddle," Alington says. "It's a good toy for that kind of thing."

Alington says that organization during the rehearsals is crucial for survival. "What I always try and aim for in this kind of thing is to leave one channel per mic so, bar changing effects, you can leave a band set on a desk and switching between bands is then a case of just muting the relevant bank," he explains. "The show roars past so quickly and there is so little time left to do any line checks just before a band is due to go on. You can't really do it on a festival-type rig of bringing different bands' inputs up the same channels. Doing three bands in the big Manor truck went very well, but it is pushing it slightly simply from the effects point of view. If we go live broadcast next year, like they're talking about, then we'll be looking at an additional truck."

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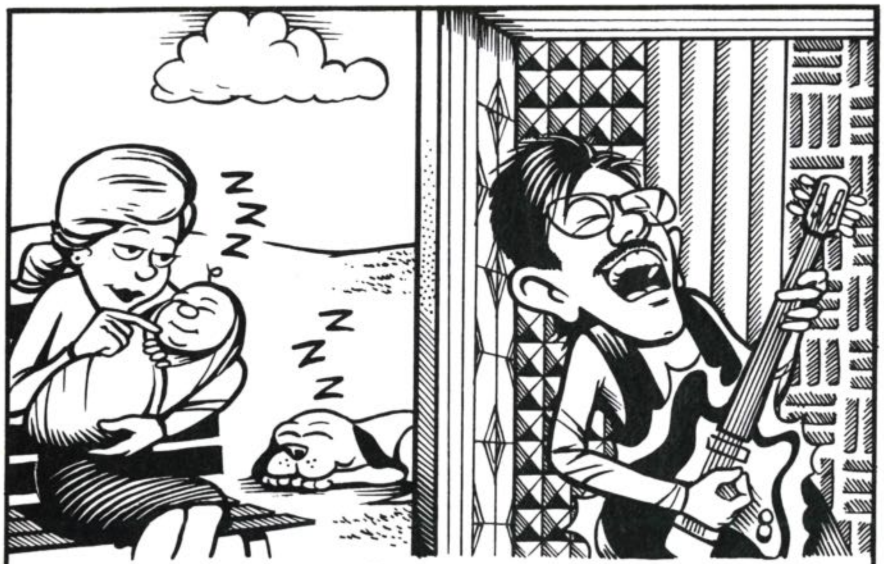

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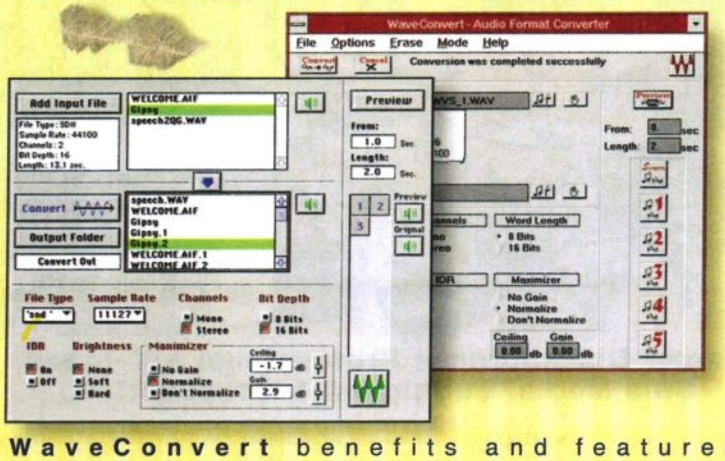

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POST-PRODUCTION

The video and audio post-production were performed at Telecine in London. As for last year, the Manor SSL truck was parked outside Telecine, enabling Alington to carry on mixing and to pop into the dub to see how Telecine's Nick Berry was progressing. It also meant that as soon as Alington finished a mix it could be sent up tielines directly to the AMS AudioFile in dubbing, thus shaving a few minutes off the process. Every minute counted, as the show had to be cut back quite drastically for broadcast the following night. The show had run about half an hour over, which meant chopping and tucking every single link and walk up and even editing some of the band numbers down. Michael Jackson's performance went out full-length, with his promo video at the head of it, whereas Bowie's excellent 16-minute set was sliced down to eight minutes.

"I sat down with my monitor mixes and cut those on the AudioFile to make sensible music edits," explains Alington, "and then gave those show timecode points to the VT editor, who then did exactly the same cuts and managed to make the pictures work around them."

"We started mixing at about 2 a.m. and started dubbing at about 4 a.m. loading in previous segments that we'd prepared," he continues. "We finished the last part at about 8 p.m., so the whole show was with Carlton (the broadcasters in the UK) before it went on air by about 30 minutes. We watched the opening of the show in the pub across the road."

The amount of editing and the time constraints conspired to make the job that little bit more difficult, according to Alington. "It's all the usual problems of this type of multi-artist live show—there's never enough get-in time or rehearsal time, and the show goes by in the blink of an eye," he says. "It's very much a case of sort it all out in the post.

"The Brits is always a bit of a strange gig to do, because it's a fantastic show but it is the gig from hell from the stress point of view," Alington says, "grabbing four hour's sleep on the Sunday night and then working straight through for 40 hours. But everyone seems pleased with it, and Initial TV are very pleased with the product so, hell, I guess I am too!" This year's Brits makes very interesting viewing. If you get an opportunity, watch it. ■

Zenon Schoepe is a freelance writer based in the UK.

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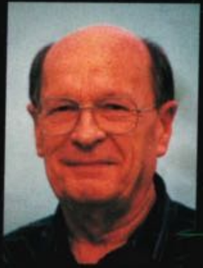

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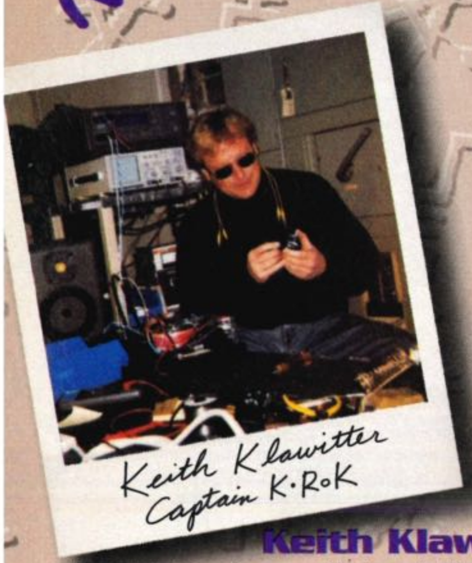
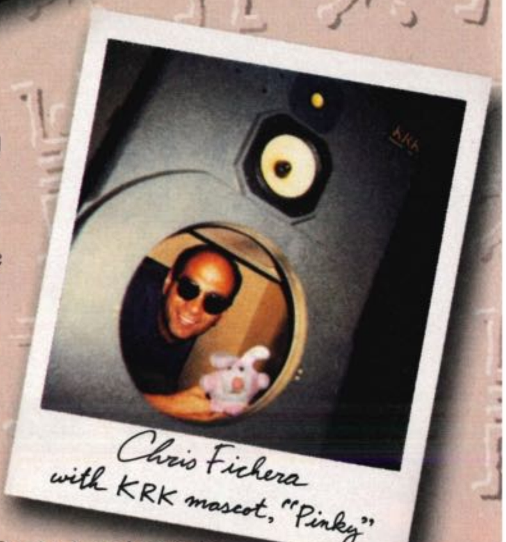


Keith Klawitter
Captain K•RoK



Chris Fichera
with KRK mascot, "Pinky"

Keith Klawitter,

KRK Systems, Inc. president and chief design engineer, started the company in 1986. Previously, Keith had worked as an independent recording engineer at many of the world's major recording and film studios and has gained numerous film credits with projects at Metro/Goldwyn, Paramount, MGM and Universal. KRK's phenomenal success can be attributed to a unique combination of exotic driver materials, proprietary crossover, stylized cabinet design and Keith's vision of uncompromising sonic quality.

Chris Fichera,

vice president, Group One Ltd., exclusive distributor of KRK Systems products worldwide, has gained international recognition as both a Grammy Award winning engineer and industry marketing veteran. "We have intentionally limited KRK distribution," says Fichera. "KRK dealers were selected on their ability to effectively serve the professional audio market with product knowledge and a thorough understanding of the recording process."

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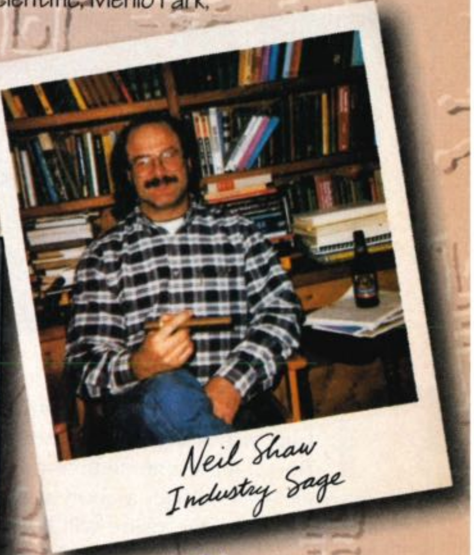
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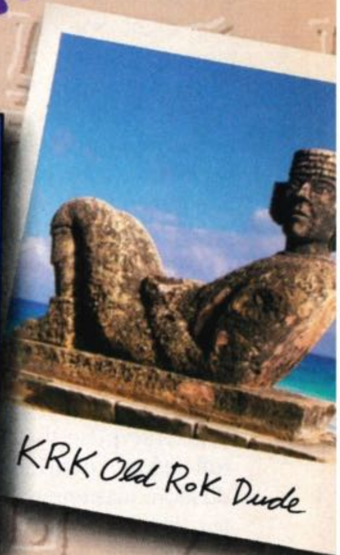
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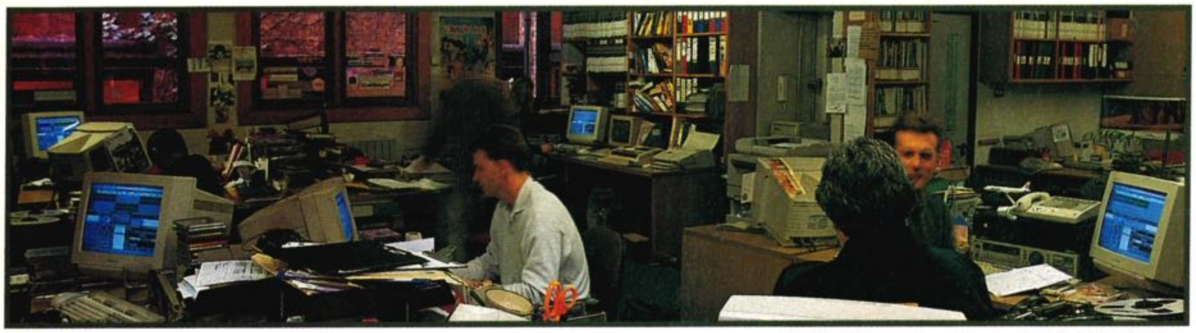

SADiE editing systems in use at InFlight Productions

PHOTOS: NIK MILNER

InFlight Technical Director Leigh Mantle

The best place to see a feature film is not on an airplane. But in-flight entertainment—whether it's a movie, a short subject on the city the plane will land in, *Cheers* reruns or the special little radio in the seat arm (really called the "personal channel unit")—certainly figures in determining whether or not passengers enjoy their flight. So, it follows that the range and quality of the audio and video material are a concern of the airlines. That's why many carriers hire London-based InFlight Productions to provide their in-flight entertainment.

IFP was founded in 1979 by two radio journalists, Steve Harvey and Douglas Moffitt, who started out providing customized audio programs for Laker Airways and British Caledonian. Since then, the company has grown to a $12-million-per-year enterprise that encompasses full-service audio and video production, mastering and duplication for dozens of airlines, including KLM, Cathay Pacific, Virgin Atlantic, Singapore Airlines, Swissair, etc. The company has always had its own facility, and in its early years, there was also quite a bit of remote and in-studio broadcast and recording work. But as the in-flight aspect of the business grew, the more traditional audio projects took a coach seat.

"In the early days when I joined here," says technical director Leigh Mantle, who started at IFP as an engineer in 1987, "there was a spate of a lot of American radio stations coming over to England and doing their breakfast shows. It was fun, and because Steve and Doug were ex-London Broadcasting Company Radio, they had that background. Like one time, Howard Stern came in to do his radio show for a week from London, and we helped with that. But our core business has always been the in-flight entertainment, and it just grew into a very big setup."

The company owns two audio studios, which are used for production, mastering and duplication of in-flight audio as well as a small amount of radio-oriented work (which includes the internationally broadcast *Rock Over London* hosted by Paul Sexton). Both rooms are equipped with Denon CD players, Panasonic and Sony DAT machines and a number of SADiE editing systems with removable hard drives. The SADiE systems are a recent acquisition that Mantle says will streamline their operations and offer the facility a solution to its massive archiving problems. "I worked out that if we invested in about 12 SADiEs and 12 DAT machines, it would actually pay for itself in about 18 months

BY BARBARA SCHULTZ

—CONTINUED ON PAGE 69

CARACOLE STUDIO

Ochoa's New Roomful of Musical Possibilities

"We said to ourselves, if we're going to take a gamble, we might as well gamble all the way," says Tony Ochoa, owner and manager of Puerto Rico's largest studio complex, Ochoa Studios. The facility has just undergone a complete rehaul. All of the rooms have been reconfigured, redesigned and re-equipped, but the "gamble" Ochoa refers to involves just one studio: Caracole, Ochoa's impressive new music-recording room.

"A year-and-a-half ago, we had a total of five rooms," explains Ochoa, who has run the facility since 1971, when his father, the studio's founder, retired. "We had two music rooms, one project studio and two post rooms. Advertising is very big in Puerto Rico. There are 114 radio stations, 60 advertising agencies, and the island is only 100 by 35 miles, so you can imagine the concentration. So, we decided to focus more on the post-production end of the business and reduce the music facilities to one room. But we wanted to rebuild the existing music room to attract more clients internationally. That's why we went to all the trouble and expense that goes with building a world-class studio. To my knowledge, there had never been a world-class music-recording studio in Puerto Rico, so it's a somewhat risky proposition."

Design of the music-recording room was handled by two New York consultants: Francis Manzella of FMRTS Design (acoustics/architecture) and John Klett of Singularity Enterprises (system design/equipment restoration). "What I found when I first looked at the existing studio was a very '70s-style design," recalls Manzella. "It was a very large room—about 22,000 cubic feet—and completely dead. It was so absorptive that it was actually unnerving to speak in there. But they have always recorded a lot of salsa, and [a dead room] is very applicable to that type of recording: It's very dry, very minimal on the effects and ambience.

"Tony's main objective with the redesign was to attract international pop work, but at the same time he didn't want to shun his bread-and-butter business, the local customers. So this became the design challenge: to modernize the room without taking away its effectiveness for local customers."

Manzella's design required stripping the room entirely, back to the bare structure of concrete slabs and masonry units (no sound isolation problems here). "In the control room, I used an RFZ approach to the design," explains Manzella. "You have a Reflection-Free Zone where the engineer sits. You steer a lot of the reflected energy to the back of the room and return it to the front with a diffusor system." Manzella worked with Troy Jensen of RPG Diffusor Systems to develop diffusors that would be function-

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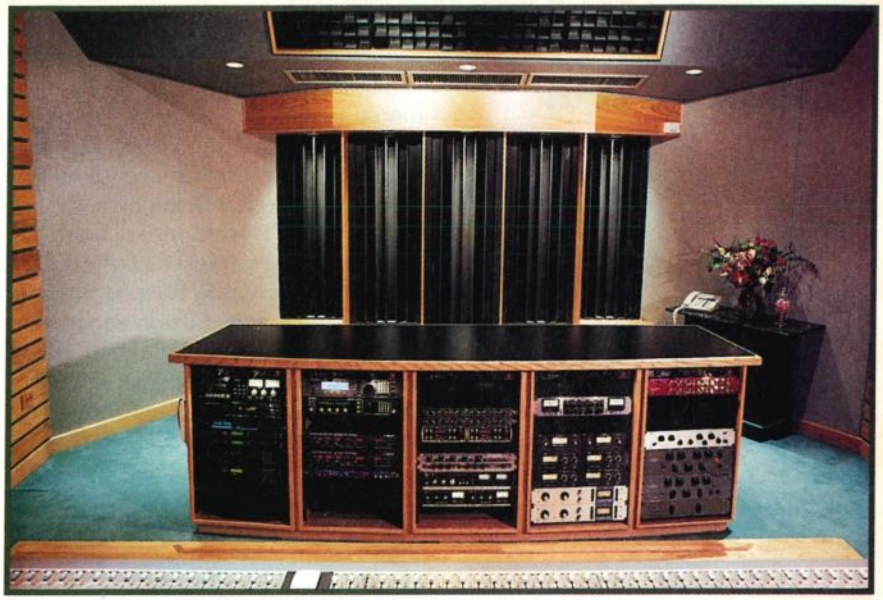
al, affordable and somewhat elegant.

"We also opened up the ceiling and used a sawtooth design, which bought us some ceiling height," Manzella continues. "Now, instead of a compression ceiling, we have a series of angled surfaces that step up as you move back." He also specified all-new fabric-covered trappings, solid oak trim and finishes, and new lighting throughout. In addition, a vocal booth was constructed adjacent to the control room, taking up part of the area that used to be occupied by the second music studio; the rest of that space is being converted to an artists' lounge.

Manzella says the studio room also gradually changes acoustically from one end to the other. In the more live end, one corner is finished in hardwood, and one corner is finished in stone. One long side breaks out into a control room-style finish with wood slats over fabric trappings. On the other long wall is the control room glass. As you work your way down from the live end of the room toward the more absorptive end, about two-thirds of the way down, all the finishes turn to fabric-covered trapping, and the far end has the most absorptive material. The studio ceiling also has a sawtooth design; the surfaces that face the live end are sheet-rocked, and those facing the deader end are treated with an absorptive surface. There is also a series of ceiling clouds, which achieve a similar acoustical effect and contain recessed lighting. "By moving mics and other things around," Manzella says, "I think now you can come up with an infinite amount of different styles of recording."



Custom RPG diffusor system in Caracole's control room

"Caracole" is a new name for this room, reflecting its new image and range of sonic possibilities. And now that it's complete, the design sounds as straightforward as it is ingenious, but the implementation of the plans—through no fault of the design itself—encountered some difficulties. John Klett, whose responsibilities to the project originally included commissioning the new Neve VIII console and rebuild-

LOREENA McKENNITT'S CELTIC JOURNEY

by Barbara Schultz

Fans of Loreena McKennitt know that her music walks a road somewhere between traditional Irish folk and the more ambient strains of acts such as Enya or Clannad. In her latest production, a long-form video entitled *No Journey's End*, McKennitt takes listeners on a trip that reveals the connections between her obvious Celtic influences and other early musical traditions. The 26-minute film includes footage of McKennitt traveling through typical scenery in Scotland, Ireland, Spain and North Africa, and archive footage of traditional music being performed, accompanied by pieces of the artist's music that best illustrate her affinity for each region. There's also voice-over and interview tape in which McKennitt describes both her own musical journey, and the historical ones that she used as inspiration.

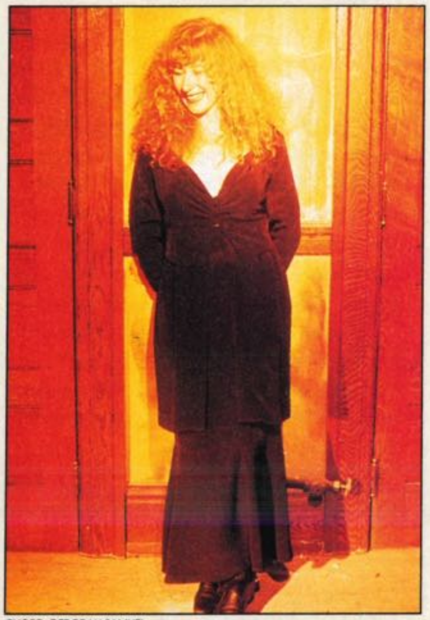


PHOTO: DEBORAH SAMUEL

To create the audio track for the film, the more recent recordings of interviews and of the ambient sounds from the locales McKennitt visited were pieced together with existing musical recordings and house mixes from McKennitt's live performances. Locky Butler, the audio post-production engineer at Tommy Ellis Audio (Dublin, Ireland) had the task of creating a fluid score from the disparate source material.

"The pictures were all edited on an Avid," explains Butler, who has been with Tommy Ellis since 1992. He edits on an AudioFile and mixes on an AMS Logic 3 console. McKennitt and the film's producer/director, Philip King of Hummingbird Productions, sat in on the entire post-production process, offering their input as to how to emphasize what was obviously the most key element of the audio track: the music.

"Because the subject of the program is very much anchored in music, the most important thing from a technical standpoint is to allow the music to come across with as much depth as I would want in the studio," says McKennitt, who has produced all of

—CONTINUED ON PAGE 66

ing, upgrading and modifying the main monitors and a number of tired tape machines, visited the island part-way through the construction and found that the project was not being built according to plan. Two months' worth of work had to be ripped out and restarted with a new crew, and Klett became the project's new construction supervisor. But Klett's attention, along with that of the equipment installer, Jack Kennedy, and a local named Johnny Gomez, got the project back on track.

"The most important thing, if you're building a studio someplace you've never been before, particularly a foreign country, is to have a guy who knows where everything is," Klett says. "Fortunately, while I was looking around for a new crew of local carpenters and tradespeople, we found a fellow named Johnny Gomez, who managed to find all the stuff we needed. If someone said they needed a 12.5mm framistan with a left-hand twist, well, I might know where to find that in New York, but I was lost in San Juan. Johnny would somehow find it. He even helped us tremendously when we discovered that ¾-inch strip-oak flooring like you'd find in pretty much any studio in the States was not even imported onto the island. It turned out that he had worked with a couple of guys in Miami who had a truck. He made the calls up to Miami and found the flooring and the flooring tool that we needed and had these guys, who he had not seen for maybe ten years, pick it up and take it to a freight for-

—FROM PAGE 65, LOREENA MCKENNITT

her own CDs. "We're talking about EQ and widening the sound or deepening the sound, and then, of course, there are some technical hurdles as far as the interviews, where we were trying to match the room tone. My mandate in that stage was to contribute where I could in addressing those technical problems, and at the same time protect the integrity of the music."

Butler says he appreciated McKennitt's involvement, especially because she had such a clear vision of the way her songs should be used. "She could tell us in certain terms if we were trailing off pieces of music a certain way. She would say, 'Well, is there any way you can leave it trail longer because there's a certain section here,' or 'There's a break in the music here that I want to keep in.'"

During the mix, Butler listens on Dynaudio M1 monitors. He says he's comfortable with the way they sound, and he's learned to recognize the way the sound will translate to television. "But I also have a small TV hooked up to the mix bus so that, if someone says, 'How is that going to sound on TV?' I can play it through a TV speaker. I do know, of course, that there will be additional processing at the television station, but having a knowledge as to how the TV stations process their sound, I do make allowances for that when I mix."

Butler says that, unlike in the U.S., audio post studios in Ireland do not lay back the final tracks. "What happens here is when we finish mastering the project onto a DAT, the DAT goes out-of-house and is laid back in a video facility. It's just the way the business has developed on this side of the world. We don't have any video capabilities [at Tommy Ellis] in terms of editing or very high-tech D-2 equipment or anything like that. So the mix from the Logic 3 was laid out onto DAT, and once the DAT goes out the front door, it's in the hands of other people."

No Journey's End began being shown in the U.S. on PBS channels in March and will continue being aired in various cities through this June. McKennitt says she doesn't have any particular agenda about what viewers will glean from the film, but she hopes that the feeling it gives her will come across. "It was funny, because we were sitting around in the editing suite and trying to determine the title," she says, "and I guess what was resonating through my mind is that, in terms of this whole path that I've anchored myself to—the Celts and the history of the Celts and the contemporaries of the Celtic people, whether it's 2,000 years ago or the present—there is no end to the journey. The Celtic expression has certainly evolved and been shaped, but there still is something that continues to be identifiable as Celtic. It was in that respect that I felt that my involvement with this subject matter implies that there is no journey's end in sight." ■

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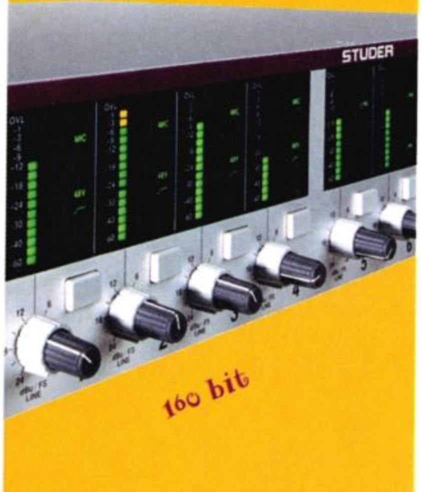

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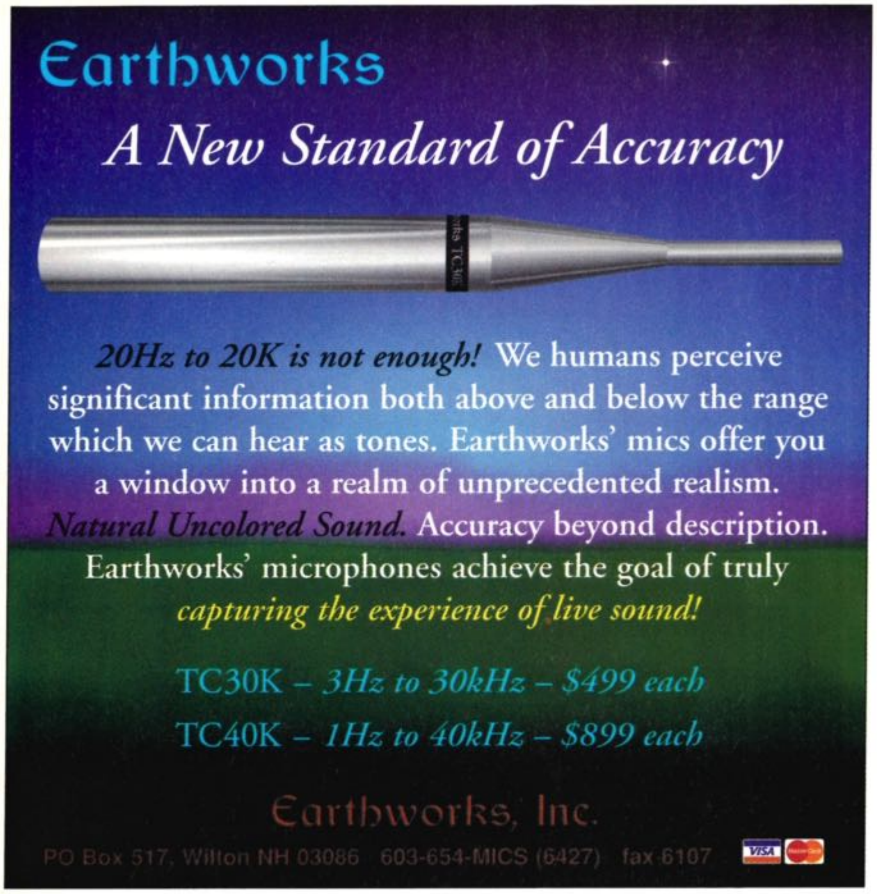
warder. Sure enough, we got the flooring in four days."

During what became his three-month trip to Puerto Rico, Klett also completed the work he started out to do: completely rebuilding one of the studio's three Ampex ATR-102s (the remaining two will be assembled by press time). "I have a standard program for ATRs," Klett says. "The motors for all three machines went to MDI Precision [Hudson, Mass.], where I have all my motor work done. Jeff Gillman at MDI inspected and rebuilt all three capstan motors and two of the six spooling motors. MDI also provided three new capstan assemblies and resurfaced the tacho rollers. These capstan assemblies have a ceramic surface for long wear and have been working out very nicely. With the motors and other work, we get the wow and flutter way down. I also went through all the electronics and cleaned a lot of things up. There is some special stuff I do, but I don't really tamper with the design. The ATR-100 machines were way ahead of their time and are to this day one of the best analog machines you can get."

Klett also restored the studio's Otari MTR-90II machines: "I had MDI do the capstan motors, and I had John French at JRF Magnetics [Greendell, N.J.] go over the head assemblies. I replaced the beng swingarms with new ones from Athan Corp. [San Francisco]. I also put the new MDI T/RED rollers on the 90s to replace the older glazed rollers. I worked pretty closely with MDI on the development of the T/REDs, and they have been working out very well. MTR-90s are good, solid, reliable machines, but the rollers glaze and the swing arms bend. It's a chronic problem that Otari fixed in the 'Q Lot' Mark IIs and later machines."

Klett upgraded Ochoa's main UREI 813 monitors by replacing the drivers and modifying the crossovers to match the new components. "I replaced the co-ax drivers with a PAS [Professional Audio Systems, Carlsbad, Calif.] CXL-1580C and a JBL 22426H compression driver for the high end. This is essentially what was in the UREI 813B, but the power handling is greater, and it is slightly more efficient. I had to modify the crossover to make it compatible by adding and changing some inductors and caps. I also changed out all the capacitors to zippy polypropylene high-voltage versions from Solen and MIT. The low-frequency driver I used is from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Fane and is much more efficient than the original that really acted more like a passive radiator. I also bypassed the big wire-wound pots in the crossovers with jumpers or fixed resistors because these pots are a source of problems. I guess what we have is something like an 813B, but with a more extended bottom and more power handling."

For near-field speakers, on Klett's recommendation, Ochoa acquired pairs of Genelec 1031As and B&W 805Hs, along with an additional set of Yamaha NS-10s and components to further accommodate pop recording engineers and artists. Klett says another impressive feature of the studio is its collection of vintage gear from UREI, Pultec and dbx, and the wide array of mics from Schoeps, Neumann, beyerdynamic, Shure, Sennheiser and others.

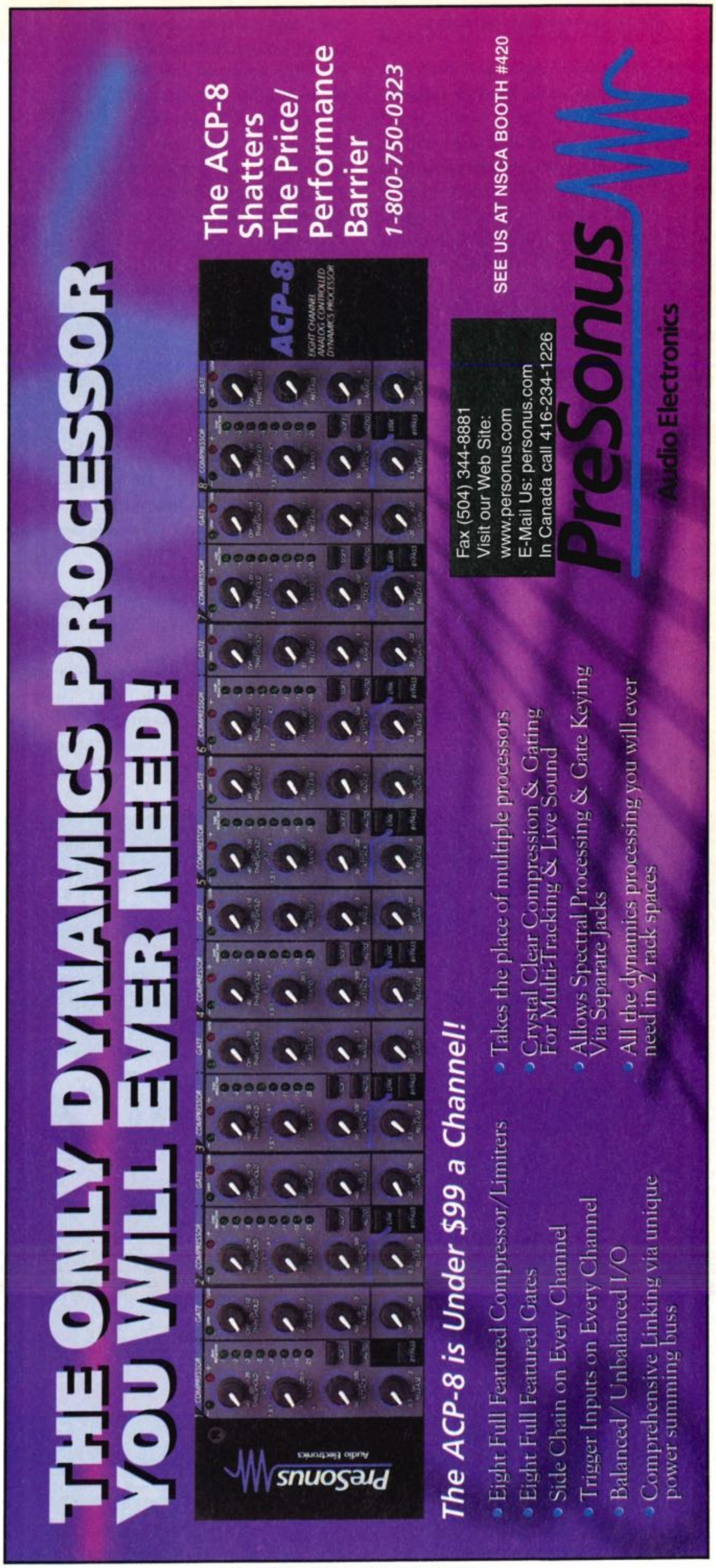
"I think it's one of the nicest rooms I've helped put together," Klett says. "It's very comfortable, the sound is great and I like really big rooms. There's hardly any big rooms built anymore, so when somebody puts together a nice big room, I get really excited."

"We want people to know that this room is as good as any room that can be found anywhere," Ochoa says. "The response from people has been great, and we want the opportunity to bring people from the States or anywhere else in the world to check us out. Anybody with money can buy equipment, but the circumstances here—being in Puerto Rico, and the attitude of the people here—create a change of pace in the recording atmosphere; it can be more relaxed. We're not on the beach, but we're 15 minutes from the beach, and we've made arrangements with people who can take clients sailing or scuba diving, to really take advantage of the island. Our other idea was to put a studio on a floating barge and go island hopping...but this is the next best thing." ■

—FROM PAGE 62, INFLIGHT PRODUCTIONS

with what we save on tape and studio time," Mantle explains. IFP's video facility is a short walk away, in Covent Garden. It was an existing complex—four floors of edit suites and duplicating operations—that IFP rescued from receivership, including all the staff and gear.

The music programming IFP offers is determined through extensive consultation with the airlines and sometimes with local DJs. "We look at the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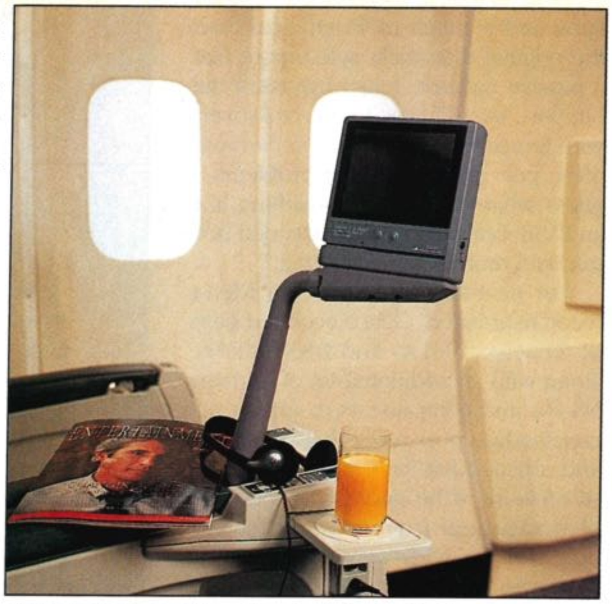
airline's demographics and find out what they want, what kind of passengers they fly. For instance, it's no good giving an Asian carrier all British pop or American music. So we also bring in people who know about music in Chinese, Japanese and other languages. When it comes to a specific genre like country music, we'll probably use a specialist who broadcasts on [BBC] Radio 1 or Radio 2." The same type of process is used to determine what types of films to offer. The material is then acquired through a licensed distributor, and, in the case of feature films, comes in whatever format requested (VHS, NTSC or PAL, etc.), the language requested and, if desired, edited for prime-time. "There was a big debate among the airlines about *When Harry Met Sally*," recalls Mantle, "about whether or not they should keep *the scene*. And there are certain movies that have never been shown on an aircraft simply because many producers and directors don't want their films edited, and they won't give permission."

Mastering any audio for presentation on an aircraft can be "very sensitive," says Mantle, whose career before IFP included nine years of music recording for Ian Anderson's Maison Rouge studios. "You know how if you go to the pictures and they've got the latest surround sound, it's very atmospheric. But sometimes that doesn't work very well on an airplane, purely because of the multiplex systems that they come through. We also have to be very careful with things like levels and compression. The noise of things like the engine and the air conditioning and the air rushing over the fuselage can actually knock certain frequencies out."

Another factor that comes into play is the incompatibility of the airlines' equipment. "Over the years, the aircraft have evolved; they've gotten newer systems or new fleets, or they have some new fleets and some older fleets. Sometimes it doesn't fit together. For instance, recently one of our clients retrofitted to CD, and on one of their aircraft types, they have all the equipment supplied by the same company, so the video audio and CD levels are the same as the output levels. But on another system on another aircraft, the video audio level is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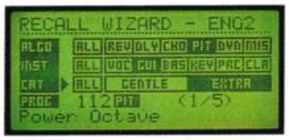
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totally different from the CD audio level. So, we've often gone out to different places around the world and spent time with the engineers and with manufacturers.

"And then the most key thing becomes the headphones on airplanes. Some carriers still use the old airphones that you stick in your ear and the speaker's in the seat. You can have the best audio in the world, and it comes down to headphones. But obviously, headphones are an enormous expense for the airlines."

Straight audio tracks—the "radio" programs—are edited at IFP, which Mantle says can be challenging, too. It can be hard, for instance, to get a symphony program to fit a 120-minute format. So, they often trim the speech portion of a program to accommodate the music. The tracks are then assembled on a 4-track master, which goes onto Otari duplicators to make the cassettes that go to the aircrafts.

"If audio cassettes are required," Mantle explains, "each of the tapes contains four tracks recorded in one direction using two 45-minute cassettes for each program. The tape has 30Hz cues at the front and end to switch cassettes. Each player takes six cassettes, and you can have a selection of mono and/or stereo programs. Typically, there are two 90-minute stereo programs and eight 90-minute mono programs, all recorded using dbx noise reduction. For CDs, each disc has four mono tracks or two stereo tracks, and each track is 120 minutes long, so you can archive eight hours mono or four hours stereo on each disc."

IFP also provides a daily news service to several airlines. Sources include the BBC World Service and Rupert Murdoch's UK satellite Sky News for flights leaving Manchester, London, Paris and Frankfurt, and CNN for flights leaving Los Angeles, Vancouver and Toronto. "We package it, we put the commercials in. Everyone tends to watch the news," Mantle explains. "So it's useful to the passengers, and advertisers want to link to that, as well."

Because most airlines change their entertainment programming monthly, the facility is constantly processing a huge volume and variety of material. At press time, projects in process included a short subject on the 1996 Olympics for Continental Airlines; a rock special featuring an interview with Mick Jagger, presented by Richard Skinner, for Swissair; an interview special with David Bowie and destination videos about Japan and Bangkok for Cathay Pacific; and numerous audio and video mastering projects. Mantle says their deadlines are mostly determined by the print deadlines of the airlines' in-flight magazines—the only aspect of in-flight entertainment that IFP does not provide.

Before any films or audio cassettes are played on airplanes, however, each tape is quality-checked at one of IFP's satellite studios, in El Segundo, Calif. (The company also has a studio in Singapore, which Mantle says is helpful as a hub of many of the Asian languages and cultures they need to accommodate.) IFP took over the El Segundo studio in early 1995 from Matsushita, the manufacturer that makes a lot of the playback equipment that the airlines use. The players must be designed to aircraft engineering specifications. In fact, the same engineers who design airplane navigation electronics systems are in charge of the video players, which also means that the playback machines are designed to run on airline-type power—400 cycles at 115 volts—which means all of IFP's studios must have specially generated power supplies to run the machinery.

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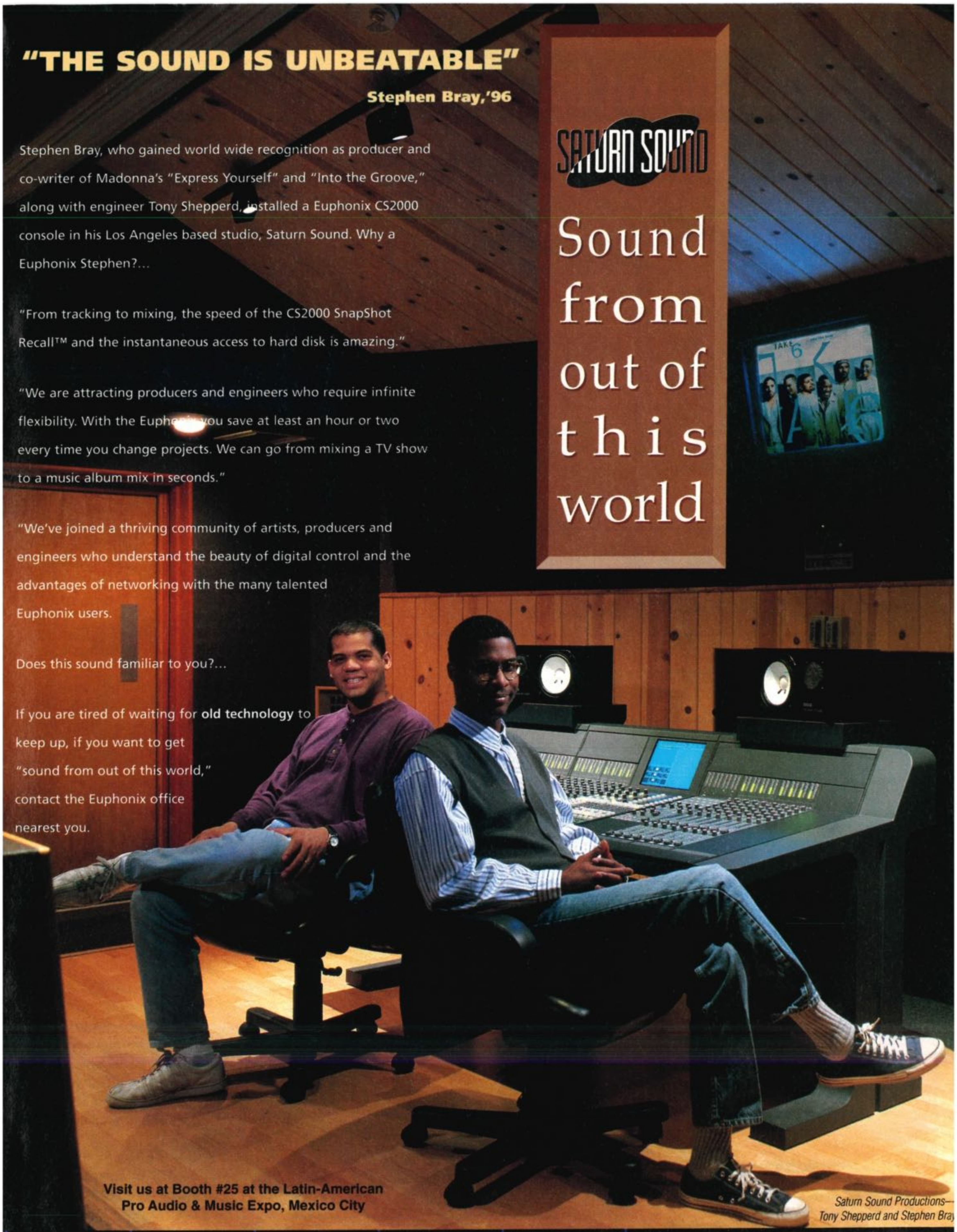

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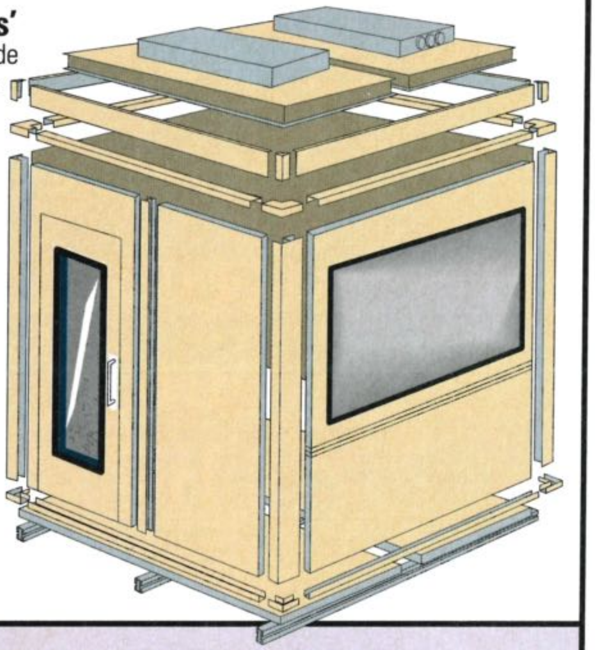

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"The thing to remember about aircraft equipment is that it has to be G-tested and fireproofed, and it has to have FAA or CAA approval before it actually goes on," Mantle says. "So you can't just go and buy a domestic video player or anything like that. It's not a standard machine, and sometimes quality suffers from the fact that they haven't got the latest product. It costs so much money to put these machines through all the testing and into a format that will work on the aircraft. They can't just go out and get the latest machine because it's got VHS and it's got digital tracking on it."

PHOTO: NIK MILNER

InFlight producer Adrienne Quartly

Mantle says a typical aircraft machine room, which is normally situated in the avionics bay of a plane (along with the black box and other aircraft electronics), consists of as many as 21 S-VHS VTRs with four audio outputs each, and up to two CD players with four CDs in each. The VTRs are usually S-VHS or Video-8/Hi-8 (the 8mm format is popular because the player package and tape size are smaller than S-VHS). All of the video and audio outputs are fed into multiplexers before being distributed, typically by a single cable, around the aircraft in a similar manner to a cable TV system.

So, technically, a lot of what IFP has to be concerned with is unique, and some of it is pretty hush-hush, because federal aviation requirements might not always mesh with movie producers' or record producers' artistic wishes. It's IFP's job to find the happy medium and still please planeloads of totally diverse audiences.

The work Mantle is most excited about right now is still in the R&D phase. IFP is working as technical consultant and liaison with several airlines and manufacturers to develop the next generation of in-flight entertainment:

—CONTINUED ON PAGE 231

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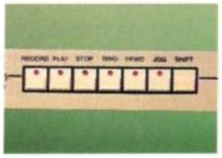

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PRODUCING HISTORY

BY MR. BONZAI

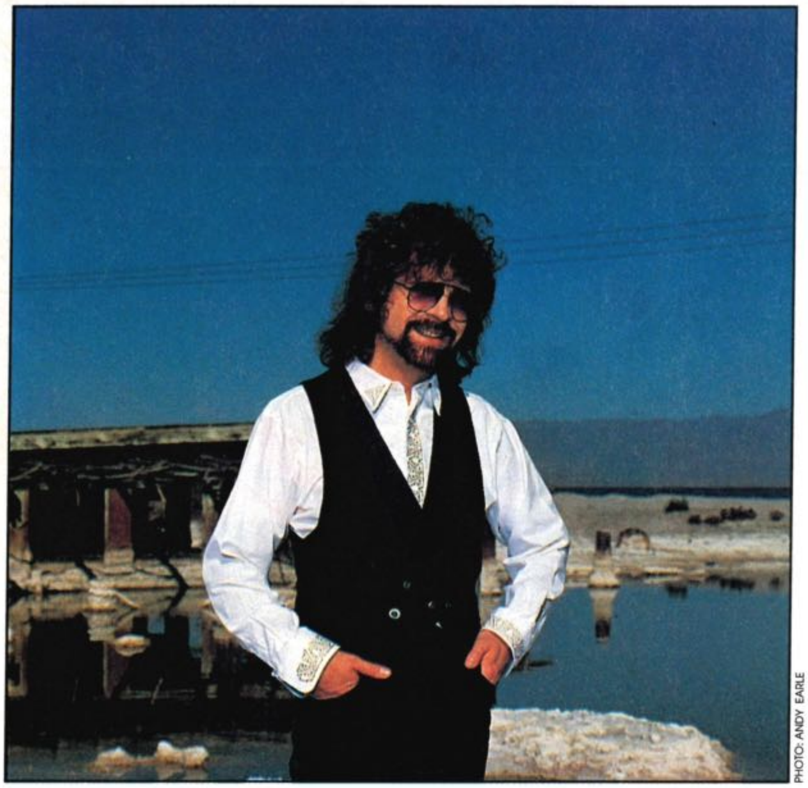


PHOTO: ANDY EARLE

Jeff Lynne, born in Birmingham, England, in 1947, is one of today's most gifted all-around musicians. Talented as a songwriter, singer and instrumentalist, he has produced some of our most memorable records, including the new Beatles tunes "Free as a Bird" and "Real Love."

Lynne became a member of the English group The Move in 1970, which led to the Electric Light Orchestra in 1971. His Beatles-influenced orchestral rock yielded such hits as "Roll Over Beethoven" (1973) "Can't Get It Out of My Head" (1975), "Telephone Line" (1977), "Evil Woman" and "Strange Magic" (1976).

In the 1980s, Lynne established himself as a producer with artists such as Dave Edmunds. This led to production credits with George Harrison (*Cloud Nine*, 1987), co-production with Harrison of the Traveling Wilburys (1988, 1990), Roy Orbison (*Mystery Girl*, 1989) and Tom Petty (*Full Moon Fever*, 1989).

Currently, Lynne is working as a producer with both George Harrison and Paul McCartney on their upcoming solo albums, and is enjoying the success of the new Beatles tracks.

Bonzai: Why did you become producer of the new Beatles songs?

Lynne: I don't think anybody else wanted to risk it [laughs]. No, I'm kidding. It was mainly because of my friendship with George Harrison. We've been working together for nearly ten years now, and I suppose it was just a natural progression. When he asked me to do it, I was totally thrilled, and I'm really glad that I was able to do it.

Bonzai: Was there any caution from the others?

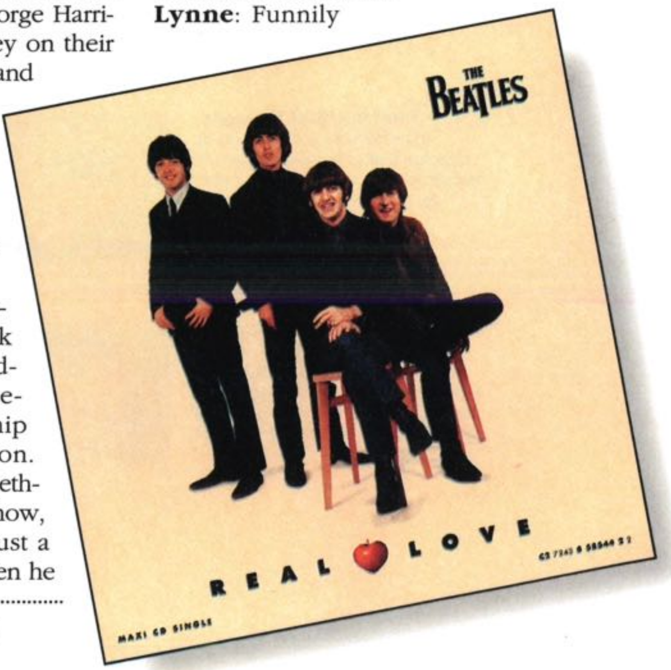
Lynne: I think Paul may have been a bit wary at first, because I was George's pal coming in to the session. But as it turns out, I became really good pals with Paul, as well. And I'd known Ringo for a while—produced a few tracks with him before. Once we'd been in the studio for a couple of days, we were all having great fun.

Bonzai: What is the story regarding George Martin in these new tracks?

Lynne: I believe George didn't have any time to do new ones, because he was preparing the *Anthology* for the last two years nonstop. I went to Abbey Road a couple of times to have a listen to the old tapes coming out of the vaults as he was preparing them for the album.

Bonzai: I was lucky enough to be invited to some of the sessions for *The White Album* when they were raiding the old vaults for sound effects and strange bits...

Lynne: Funnily



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enough, I went to a session on *The White Album*.

Bonzai: Was that your first meeting with The Beatles?

Lynne: Absolutely. I was making my first record in a studio called Advision, and the phone rang. It was a friend of the engineer who asked, "Would you like to come down and watch The Beatles recording at Abbey Road right now?" Yes, please, and whoosh, I was down there. Unbelievable.

Bonzai: You were only about 20 years old?

Lynne: Around that age, yes. I was trying to become a producer and had already been doing some songwriting. So, to go down and listen to what George Martin had done with The Beatles was fantastic. They were just doing "Glass Onion" at the time, and doing the strings with George conducting the orchestra.

Bonzai: When you started on this new project, in what form did you get John Lennon's song?

Lynne: It was just a cassette with John playing piano. It was in mono, and it was an old tape, so it was a very tricky bit of source material to use.

Bonzai: No separation between the voice and piano?

Lynne: None at all, no. There was no way of EQ'ing it because he was playing right in the midrange, which is where his voice is. So, there was no real way of separating them, and we had to make it into something instead of getting rid of it.

Bonzai: What were your feelings the first time that you listened to the tape?

Lynne: My first feeling was that I really liked the song, but then I thought, how are we going to make this into a Beatles record with everybody playing on it when the lead voice is already so quiet? That was the tricky one, but I knew it could be done. I just didn't know how to do it at that point. It was a matter of just working on it and seeing what happened, really. It was uncharted territory.

Bonzai: When I first heard the finished song, I felt that John's voice sounded like it was in a different space, but now I realize that's the way it should be, with John singing across time with the other guys.

Lynne: Yes, it's exactly that. Obviously, EQ and stuff—I couldn't do much to it. I couldn't fatten it up, because that fattened up the piano. I tried every sort of EQ, and it is a different sound—that's the sound he had on his cassette player when he was singing at his piano. That's the sound he made in his room, and there is no way I could alter that. That is what he did and there is nothing I could do to mess with it. I just wanted to keep that as pure as I could.

Bonzai: And the production work was done at Paul's studio. What is his studio like?

Lynne: Just like any other really good studio in the world. Top of the line. All the things you might like, a big Neve—a whopper, with Flying Faders.

Bonzai: Did you bounce over to a digital multitrack?

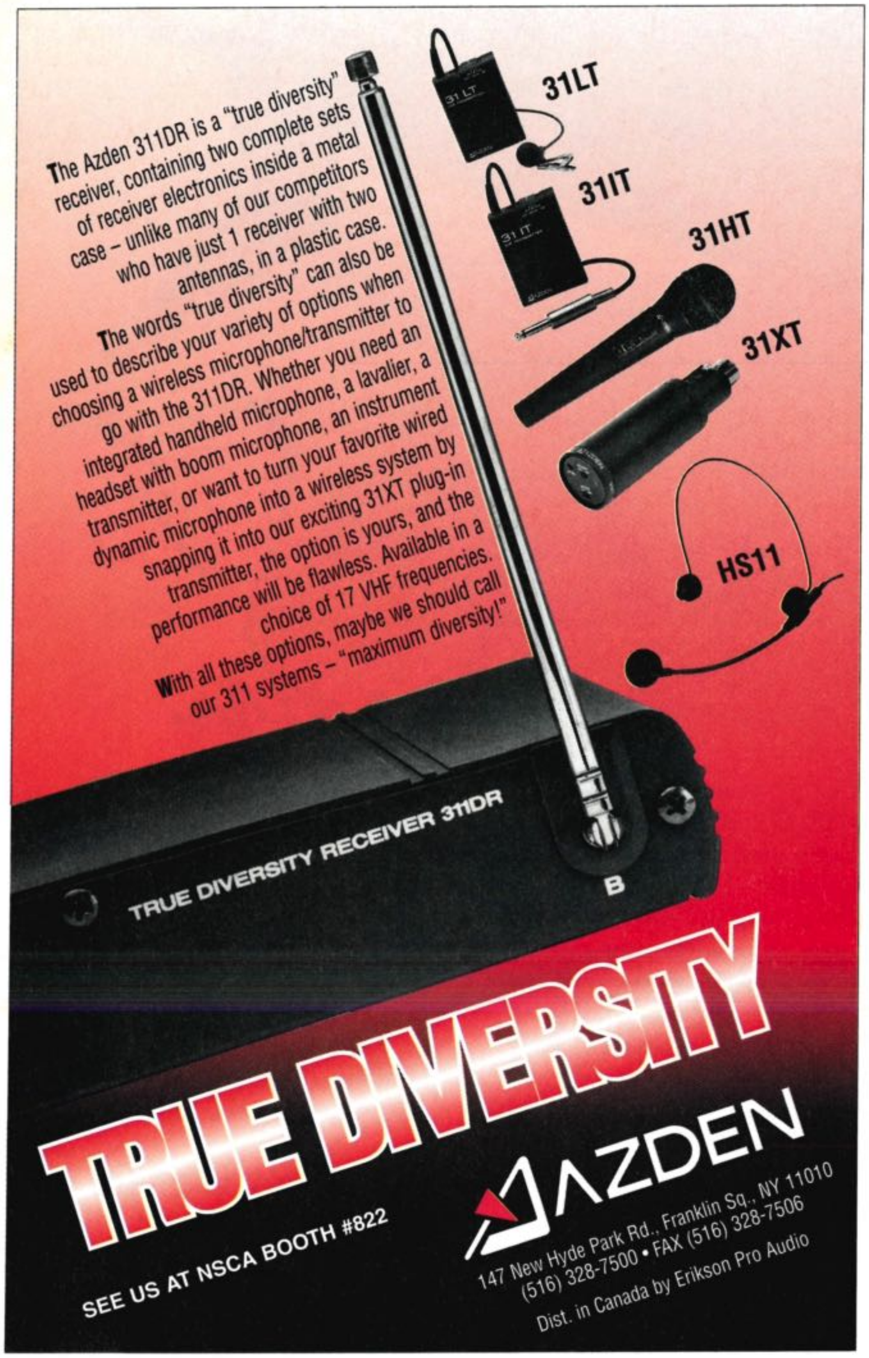
Lynne: No, analog: two Studer 24-tracks locked together. Normally, I would try to squeeze it onto 24 tracks, but in this project, it was pretty much impossible with all the tricks and things that had to be done.

Bonzai: What came first with the new stuff?

Lynne: First, we actually all sat around strumming it to get a feel for it. So, the first new recording was George and Paul on acoustic guitars and Ringo's drums. Then came the normal way of adding instruments as we go. George's lead guitar and his slide guitar, all the riffs. Paul on piano.

Bonzai: Did Paul emulate John's piano?

Lynne: Yes, he did. That was really the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only way of doing it, so that it was a continuous sound, like a weld trying to get the voice into the track.

Bonzai: Who was in charge at this stage of the game?

Lynne: Me, I suppose, because that was my job—to make it work. That's what I went for, to try and get The Beatles to play on a record again. But there again, it was very much a cooperative effort.

Bonzai: And Geoff Emerick was your engineer?

Lynne: Yes, Geoff and his assistant, John Jacobs. You could say co-engineer.

Bonzai: After all these years, what's your opinion of Geoff?

Lynne: A really great bloke, very knowledgeable and a nice guy. After the sessions, we'd go down to the Indian restaurant, or over to Paul and Linda's for dinner. We hung out and talked about making records. In fact, when we first went into the studio, I was sort of nervous about meeting Geoff Emerick, because he had been doing all those fantastic Beatle records for all those years along with George Martin. It was a tough thing to follow. I remember thinking that it was the biggest test for me.

Bonzai: No friction at all?

Lynne: Well, funnily enough, we thought along the same lines immediately, and there was never any friction, no. We got on really well, musically and soundwise.

Bonzai: Did any surprises come up in the studio?

Lynne: Not really. It was pretty much well-thought-out about the parts and harmonies, and then George and Paul started working on the backing vocals. It was such a thrill, because it sounded just like The Beatles, which it was, of course. Just in the kitchen, you know, striking it up and doing a two-part harmony and practicing. A lot of things were magical simply because when Paul plays piano and bass, it sounds like him, you know? When George plays guitar it sounds like him. When they sing harmonies it sounds like them. So, you didn't have to do anything to make it sound like that—it just happened naturally.

Bonzai: How many tracks did you finally end up with?

Lynne: 35 or 40, something like that.

Bonzai: Was there any new and special equipment that was indispensable?

Lynne: Well, basically it was made with the equipment you could have had then; 99 percent of it was equipment that was available in 1978.

Bonzai: No gadgets?

Lynne: No gadgets. The synchronizer between the two tape recorders was probably the biggest gadget. Nothing in the way of sound enhancement. It was basically just EQ, a bit of compression here and there, and nothing that you wouldn't find in any studio for the last ten or 15 years.

GEORGE
HARRISON
cloud nine

Bonzai: Isn't there a strong feeling of John, similar to his solo albums as well as his songs with The Beatles?

Lynne: That's exactly it. I think the song dictates the way it goes, because of his chord structures and his melody. That's a real John Lennon song, the structure of it. Because he's done it, that dictates the feel of it.

Bonzai: Ringo's drums are very faithful—good ol' Ringo, laying it down. Is there a lot of compression on his drums?

Lynne: There's some compression, like there always was on all the Beatle records. I think it's no more excessive than the old records. The reason I can say that is because Geoff Emerick was the engineer, so we knew what realms we were in, the parameters of the sound.

Bonzai: Have you heard about another take of "Free as a Bird" on the Internet?

Lynne: Don't know anything about that. I did hear that John's original piano demo of the song is on the Internet.

Bonzai: "Real Love" is part of the second *Anthology* installment. How long after the first song was that recorded?

Lynne: Nearly a year later.

Bonzai: Anything different?

Lynne: Yes, I had to bring in Marc Mann for this one. He's a great musician and a computer expert. I brought him into my studio to clean up the vocal track, which had about a thousand clicks on it, tons of white noise and some nice rumble underneath from AC current. The clicks were like static and we managed to get every one out, and get rid of the hiss and rumble.

Bonzai: What did you use for that, Sonic Solutions?

Lynne: That and a few other programs. It took a week's work just to do that, until I had a clean enough tape to take to England to work on.

Bonzai: How did things fall together then?

Lynne: More or less the same as the first one. Same idea, running through the song, Ringo playing along with acoustic guitars to start with. They had a good feeling for John's song, obviously, having worked with him for all those years.

Bonzai: Is it true you're going to continue working with Paul?

Lynne: Yes, I've done three new songs with Paul and me producing—three of Paul's songs that are great. I'm really pleased with them, and I think he is too. We did them at Paul's studio in Sussex.

Bonzai: Let's move back to your beginnings, with the band The Move in 1970. Were you in a band before that?

Lynne: Yes, I was in a band called The Idle Race. It was in that period that I got to go to The Beatles' session. The Move had been going for about four years when I joined them and were sort of not doing that well, you know? We decided that we were going to make this new group, ELO, and so I joined with Roy Wood and drummer Bev Bevan. We played it with The Move for a bit while inventing this new group. We kept playing as The Move for about a year, and then we stopped and went straight into ELO.

Bonzai: ELO went on for what, 20 years?

Lynne: Not really. I would say it finished—it should have finished—by 1980, but it went on till about '84. It was contractual obligations of mine that required me to keep making albums. I really had had enough by then of doing that format.

Bonzai: Did your original concept of the band fulfill itself?

—CONTINUED ON PAGE 209

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SONGS FOR THE WHOLE FAMILY

STEVE RASHID AT HOME AND WORK

For his past two albums, Steve Rashid has won nine national awards. *i will hold your tiny hand*, a collection of self-penned lullabies, was released in 1993, and a year later came *Fidgety Feet*, a playful, swinging jazz romp through Americana, interspersing standards with hidden treasures. Children's music would be the easy label; family music would be more accurate.

Steve Rashid (standing) and Ryan Beverage

"We teach our kids categories," says Rashid, who with his wife, choreographer and dance instructor Bea, is raising two boys, Robert, age 7, and Daniel, 3, in Evanston Ill. "We teach them that this is rock 'n' roll, this is jazz, this is the blues. But before we teach them those categories, they either like it or they don't. Nobody is more passionate and nobody is going to scream louder than a 2-year-old. So if you're going to let them rock to something, why not give them some real rock 'n' roll.

"I think we tend to underestimate what kids are able to hear and comprehend and enjoy—we think it has to be light and twinkly all the time," he continues. "I believe there's a way to create music for kids and adults that invites a shared listening experience. It's kind of the Bullwinkle test. I still laugh at Bullwinkle, and so does my 7-year-old son. Someone said it very succinctly the other day: Older plays younger, but younger seldom plays older. I'm trying to play both ways."

The seeds for Rashid's career were laid early. In the 8th-grade band, he was 11th chair of 11 trumpet players—"a horrible, miserable player," he says. His dad's birthday was coming up, and he asked him what he wanted. Dad said, "A Louis Armstrong record," and on the night of his birthday, Rashid's father sat down with the 13-year-old Steve.

"I remember it like it was yesterday," Rashid says. "We were sitting in my room, and I had my trumpet in my lap. He put on the record, and I burst into tears. The light went off in my head, and that was the moment I decided to be a musician. There was something so magical about the way he played his horn, and something so undeniably beautiful—like a big secret that someone just told me and I had to share. My dad died when I was 15. But he was a writer and photographer, and I feel like I understand him better for the writings and photographs he left behind. So one of the reasons I'm doing this series of albums is purely selfish—creating artifacts for my own family.

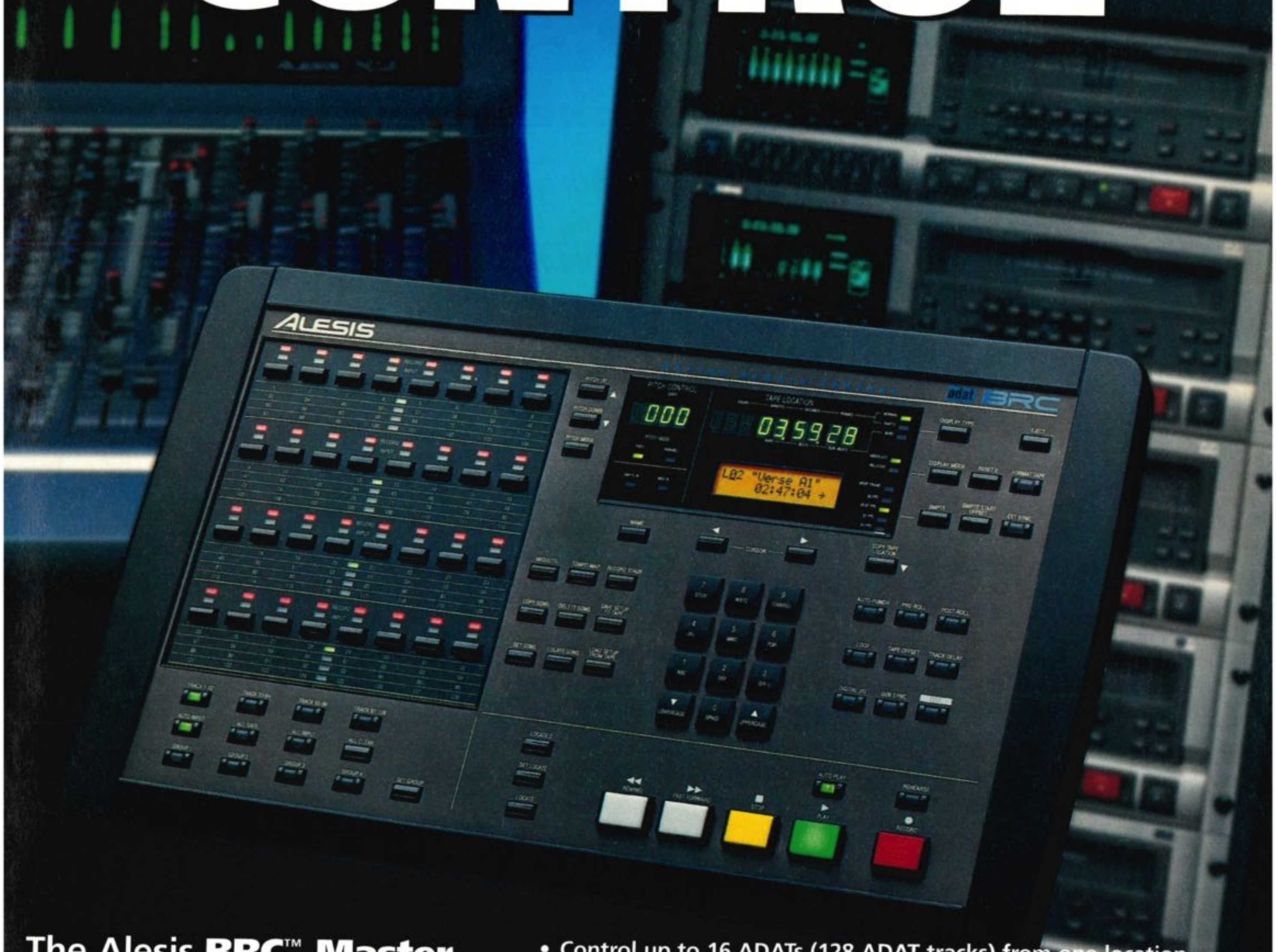
Rashid is a musician first and foremost, a keyboard player and a dabbler who woke up one morning and found that he owned a studio. After completing his master's degree in musical composition at Northwestern, he was interested in putting his ideas on tape, and he began an apprenticeship under Justin Niebank (now engineering hits in Nashville) at a small Evanston studio known as Q&R Recording. Niebank left soon after for Streeterville in Chicago, and Rashid began managing the facility and engineering, not to mention assuming a second career in jingle writing. Eight years later, he bought the place, redesigned it, upgraded the equipment and renamed it Woodside Avenue Music Productions.

BY TOM KENNY

Woodside today lies somewhere in that nebulous zone between commercial facility and project studio. There are paying clients, but they come for Rashid's production chops. Two studios feed the single control room, which houses a Tascam M-3500, 24 tracks of ADAT (with BRC), B&W DM560 monitors, Panasonic SV-3700 DAT, a synth rack with a Roland S-50 as the controller, Sound Tools, and his new favorite piece of outboard gear, an Aphex Tubessence 107. ("I sing through a Neumann U87 or Shure SM7," he says, "run through Tubessence.") He writes at a grand piano and arranges in Master Tracks, Performer or Studio Vision. Audrey Clarke has been his assistant for a few years now.

The commercial aspect of the studio is likely to be trimmed back soon, and Rashid may be looking for new digs in the neighborhood. He's tiring of running a business and would like to spend more time creating music.

"I would rather be writing than engineering," he says. "And I would like to lower my monthly nut. Basically, I would like to scale back the facility so that I can feel comfortable sitting alone in the studio just writing for a day without making any money. For the last five or six years, I've been building credentials in this kids' field, yet the only projects I've pursued are my own albums. That's ridiculous. If I'm looking to do things besides my own albums, then I should be looking at other opportunities within the kids' educational field." ■



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BACK TO OHIO

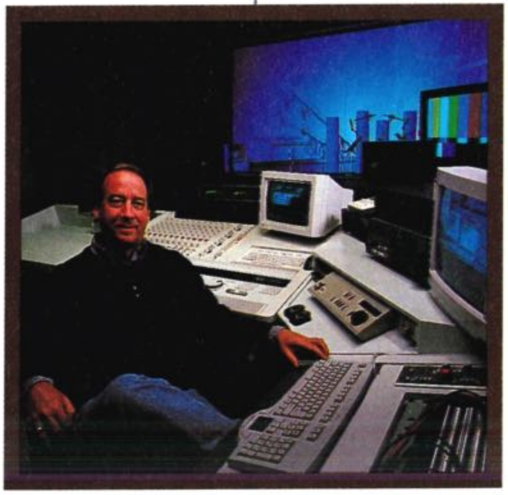
Cleveland and Cincinnati Shine as Secondary Commercial Hubs

BY DAN DALEY

Stretching from the Land o' Lincoln to the Buckeye State, encompassing Hoosiers and Walleyes, the North Central U.S. is simultaneously huge and anonymous in the recording world. It resurrects memories of a time when the modern entertainment culture was a heartland nexus, a breeding ground for a wide variety of music, from the Ohio Players to Grand Funk Railroad to John (Cougar) Mellencamp. A time when Champagne, Ill., was a required stop on any serious club tour and the Agora chain of clubs throughout Ohio launched a plethora of acts, as did the smaller but singular venues like Bogart's in Cincinnati. Hey, did I mention Michigan? Detroit gets its own book.

The region hasn't changed, but the culture did. What happened in cities like Cleveland and Youngstown in the 1970s is a lot like what happened in Seattle in the '90s. (And if it's any consolation to those in Indiana and other North Central states, Sony Records didn't set up an office there, either.) So, the business end of the culture moves on and looks for the next big thing in the next new place. That leaves what we're calling the North Central U.S. with a lot of memories. Perfect place to put the Rock and Roll Hall of Fame.

But other kinds of business continue to thrive, and Cleveland and Cincinnati, on opposite ends of Ohio but inextricably linked in terms of pro audio, have become busy hubs of regional and national advertising. And at a time when commercial audio has become more high-end than ever, that has meant that the recording infrastructure of those cities has changed along with it.



George Gates, president of Commercial Recording Studios, Independence, Ohio

"Neither one is a real music city anymore," recalls George Gates, owner and manager of Commercial Recording Studios in Independence (near Cleveland), which in 22 years has seen most every phase of Cleveland's audio history. "There was a time when Cleveland was a big place for music, when the city meant something significant from a recording artist's standpoint, when Cleveland Recording Studios would do Grand Funk records. But that's all gone now. What we're doing now is a lot of advertising work. And that business is doing very well for us and some other [area] studios. Fifteen years ago, local studios dealt with advertising work as filler around their music projects, and the local agencies had to go out of town for studios. Now [commercials are] the main business here." In the process of shifting from a music base to a commercial one, Cleveland and Cincinnati have become microcosms of the change undergone by all secondary markets in the U.S. recording industry.

Gates' studio has four rooms, each equipped with Lexicon Opus workstations. One room also has an extensive MIDI sequencing and synthesizer component running through a Neotek console. The lack of linear storage reflects the fact that, like many of the other major facilities in the region, virtually all of Commercial's work is, well, commercials, with spots for such agency clients as Appleby's Restaurants, Sterling Jewelers and the *Cleveland Plain Dealer*—and agencies of all sizes have come to expect digital audio.

Despite the fact that virtually all work is for regional agencies, Gates says technology has opened up Cleveland's advertising and audio base, primarily via ISDN communications, which makes talent from Los Angeles and New York instantly accessible. "It diminishes the emphasis on location," says Gates. "We have the same access to talent pools as anyone else, and as a result, so do our clients. Now, we realize that that doesn't mean we're going to draw work away from New York or Chicago. But it does allow us to widen the range of work we do and the range of services we can offer clients." And additional services benefit overall revenues; projects that used to be finished in larger market facilities now can get completed in Cleveland, Gates adds.

Beechwood Studios' Audio A recording suite; right: Beechwood's John Cesario

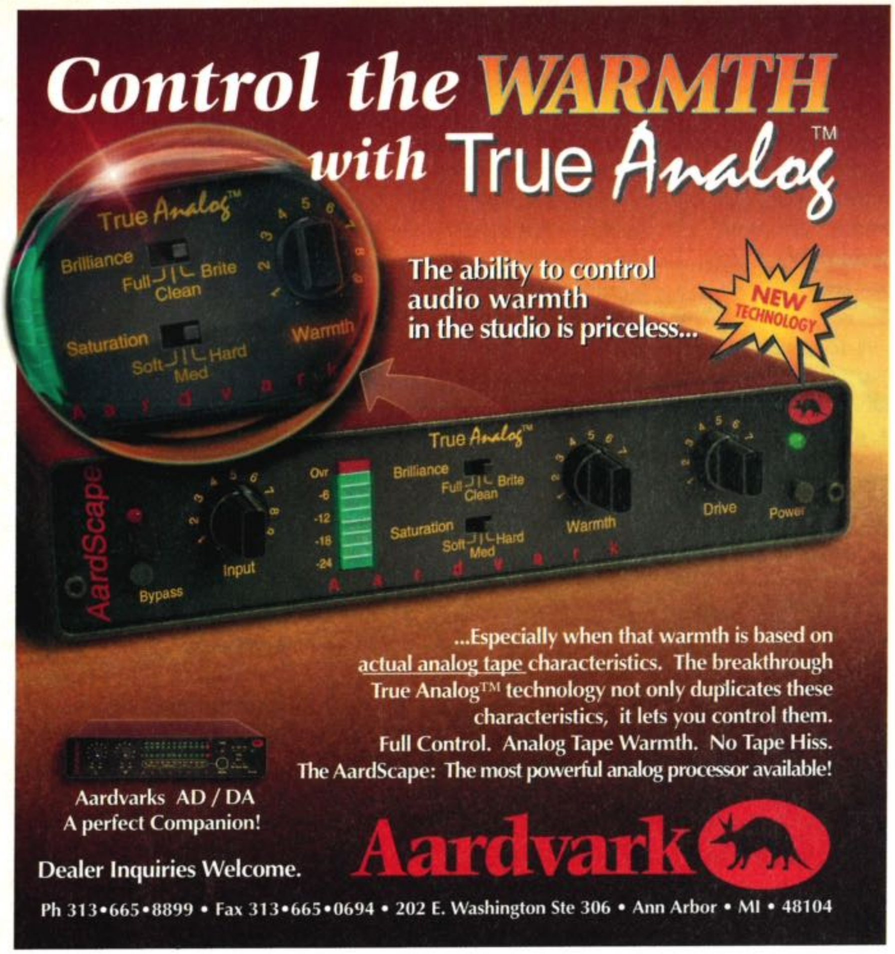
GOING OVER THE BORDERS

Still, studios in Ohio, as in other secondary markets, have to cast a wider net than those in primary markets. "If we had to rely on local business, well, there's simply not enough of it," states Jack Streitmarter, president and creative director of Sound Images in Cincinnati. Streitmarter's four studios, two of which house WaveFrame systems, are used for post and scoring work for local and national accounts, including McDonald's, Procter & Gamble (whose Cincinnati headquarters provides significant work for several Ohio studios), TCI Cable and Totes. "There's a lack of big-account work regionally," he adds. "To give you a comparison, in St. Louis, a similarly sized city, the agencies there do over $100 million in billings annually; Cincinnati tops out at around $70 million in billings. So you have to look into other regional and even primary markets in order to get enough work to maintain profitability."

The other key, says Streitmarter, is to keep a regional studio's repertoire as varied as possible. Like other area studios, Sound Images does original music as well as straight agency recording. And scoring has become a larger presence in the business mix for the facility, raising the budgets and the stakes. In addition, Streitmarter stresses that in-house talent is becoming increasingly important as agencies emphasize cost-effectiveness for their own clients. "The clients have gotten pretty sophisticated when it comes to the technology of digital recording," he says. "They've spent time working in facilities in New York and Chicago, and that's raised their expectations. Our response is not so much to emphasize the specific equipment as it is to have the [technical] talent that can get the most out of it for the clients. The clients aren't as technology-buzzword conscious as they might have been in the past. They know the names of equipment and what it can do. So a studio has to make sure they can get all they can out of their technology, and the key to that is having the best talent. You have to rely more on the person behind the board than on the board itself." Sound Images has staff editors and engineers from far beyond Cincinnati, including one staffer from New York.

In casting wider nets, some studios have gone to the mountain rather than waiting for the mountain to come to them. Rich Goldman Productions, which operates two Pro Tools-equipped digital suites (one with Dolby Surround capability) in Cincinnati, opened a satellite office and forged a relationship with a local studio in Chicago several years ago. Although that relationship is no longer in place, Goldman contends that it did much to both increase business and awareness of his facility beyond city limits. "We've still held onto the accounts that came from that venture," he says. Current national accounts include McDonald's, Sprite and

Studio A, Sound Images Inc.



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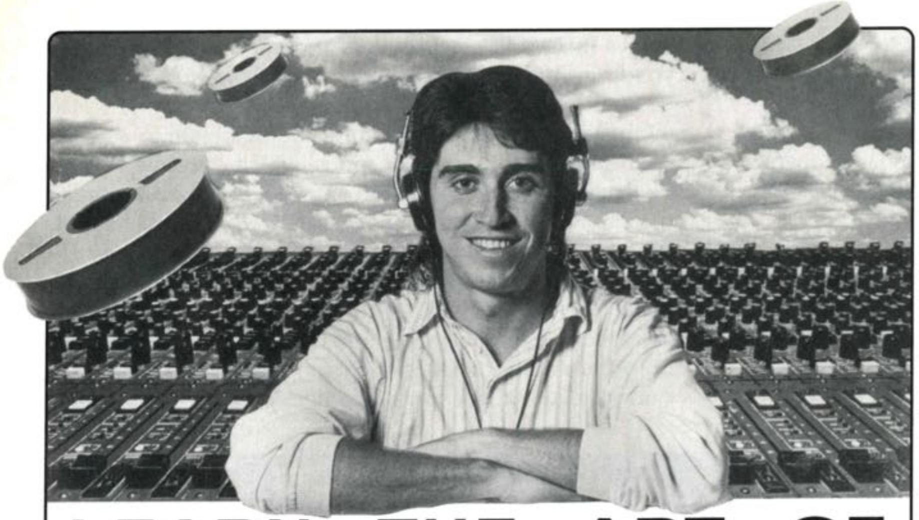

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CORPORATE WORK AND OTHER SPIN-OFFS

As for related revenue producers, Goldman notes that companies like Procter & Gamble have a need for corporate audio work, as well as commercial work through agencies. "I'd say that local studios probably get more consistent work along those lines than for their commercials," which requires both in-house original music capability as well as extensive sound libraries, he says. Wider geographical and repertoire nets have also brought Goldman's studio into new fields, such as audio work for interactive game software from San Francisco and Chicago, including audio for Sony's Playstation system and other CD-ROM-based products. "When you're in a place like this, you have to go out to new clients," he says. "At the same time, one thing you learn is that studios and facilities in other parts of the country are sometimes overworked in terms of specialized audio, like games. If you have the capability to do specialized work like game audio, you can get clients that might have stayed in their own backyard to come to you."

Technologies like ISDN also make studios seem "like they're around the corner" from distant clients, Goldman adds, noting that he recently storyboarded a project for an out-of-town client using QuickTime via the Internet. "The higher the technology, the more level the playing field becomes," he states. However, he adds, that is limited mainly to specialized audio projects like games. When it comes to spot commercial work, "Digital does not level the field. Not when plane tickets are cheap and they can go wherever they want for one day's work."

Back in Cleveland, Beechwood Studios gets its work from a combination of regional and national accounts, including spot work for regional agencies like Malone and for national agencies like J. Walter Thompson and Wise Advertising. Some of the spots for the smaller chains like Appleby's and The Home Place wind up running nationally. "You get national spot work, but often it comes by way of regional spots going national," explains studio manager John Cesario, who says that regardless of how a spot gets wider broadcast, it helps the credibility of the studio that handled the audio.

Beechwood has more extensive video capabilities than most area stu-

Control Room A, Goldman Productions, Cincinnati, Ohio

dios, including an Avid suite to complement its 16-track Post Pros, Euphonix console and 24-track analog capability. "You don't have to be full-service for this market, but it helps," Cesario says. "We can shoot the spot and post it. But mainly you want to have a specialty that gives you a lead in a niche in the market."

Underscoring earlier remarks about the increasing sophistication of clients, Cesario notes an interesting trend he's observed recently: Clients are less brand-conscious of technology, but they're becoming more feature-conscious. "They understand and want things like instant recall capability to be able to change spots quickly," he says. Brands continue to play an important part of technology decision-making, though. "In terms of buying an instant-recall console, I could have gotten away with something like a Yamaha 02R and spent considerably less money," he says. "But you have to consider that clients come in from all over, and they're used to certain names. The Euphonix name made a difference in the decision to buy, as did our feeling that it was also a good music console." (Beechwood does music recording as well as post work; Filter, an offshoot of Nine Inch Nails, did work on their first record there.)

Finally, the economics of regional studios work to their advantage when it comes to both local and national work. Lock-to-picture work at the studios mentioned runs between $175 and $200 per hour, considerably less than the $300 to $350 that Chicago and New York facilities routinely charge. Audio-only rates average $130 per hour. But as Gates of Commercial Recording puts it, "Things cost differently for different markets. Everything is relative, except the quality of the finished product. At that stage, you're competing with the world." ■

Dan Daley is Mix's *East Coast editor. He played every club there was in Ohio, at least once. But that was a long time ago.*

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SOUND SYSTEM EQUALIZATION

LIVE SOUND ENGINEERS

BY CHRIS MICHIE

The maturation of the live sound industry has led to the increasing standardization of practices and equipment. Today, most sound equipment rental companies can provide a system capable of producing 20 to 20k Hz with passable accuracy at more than adequate levels. Modern FOH mixing boards offer multiple submix and matrix outputs, which ease the creation of the multiple subsystems necessary for optimal coverage in some applications. Loudspeaker manufacturers have one or two decades of experience in trying to perfect arrayable clusters.

These advances have greatly simplified the assembly of consistent touring systems. Today, competitive systems are generally reliable, deliver high SPLs and occupy much the same amount of truck space. Of course, most manufacturers and rental companies claim their systems sound "better" or are more cost-effective than the competition's, and most live sound engineers have a preference for particular systems and components. But most agree that the one factor that most affects the sonic character of a sound system in a room is the room itself.

Simply running pink noise through the system and using third-octave graphic EQs to get a "flat" response on the display of a real-time analyzer is no guarantee of good sound.

At present there are only two ways to change the room/system response: alter the room acoustics or electronically adjust the frequency response of the sound system. Bob McCarthy, director of SIM® engineering for Meyer Sound (Berkeley, Calif.), summarizes the options. "Architectural solutions are great when you can get them," he says. "For highs and mids, they're quite economical and are beneficial to very large sections of the audience. When it comes to low frequencies, architectural solutions are humongously expensive, tremendously impractical and, for a touring professional, often a complete impossibility—they have no cards in their hand. An electronic solution is the only game in town."

The electronic solution involves the following: A known signal source, such as a swept sine wave or pink noise (or even music, in the case of SIM and related systems), is reproduced through the sound system. One or more measurement microphones placed in the room feed an analyzer, which displays either the resulting room/system response or the differences between the known signal source and the measured output. By manipulating equalizers placed across the loudspeaker system inputs, the operator modifies the system response so that resonances and other anomalies introduced by the room are eliminated, or at least reduced.

There's a lot more to it than that, of course. Simply running pink noise through the system and using ⅓-octave graphic equalizers to get a "flat" response on the display of a real-time analyzer (RTA) is no guarantee of good sound. Some peaks and dips

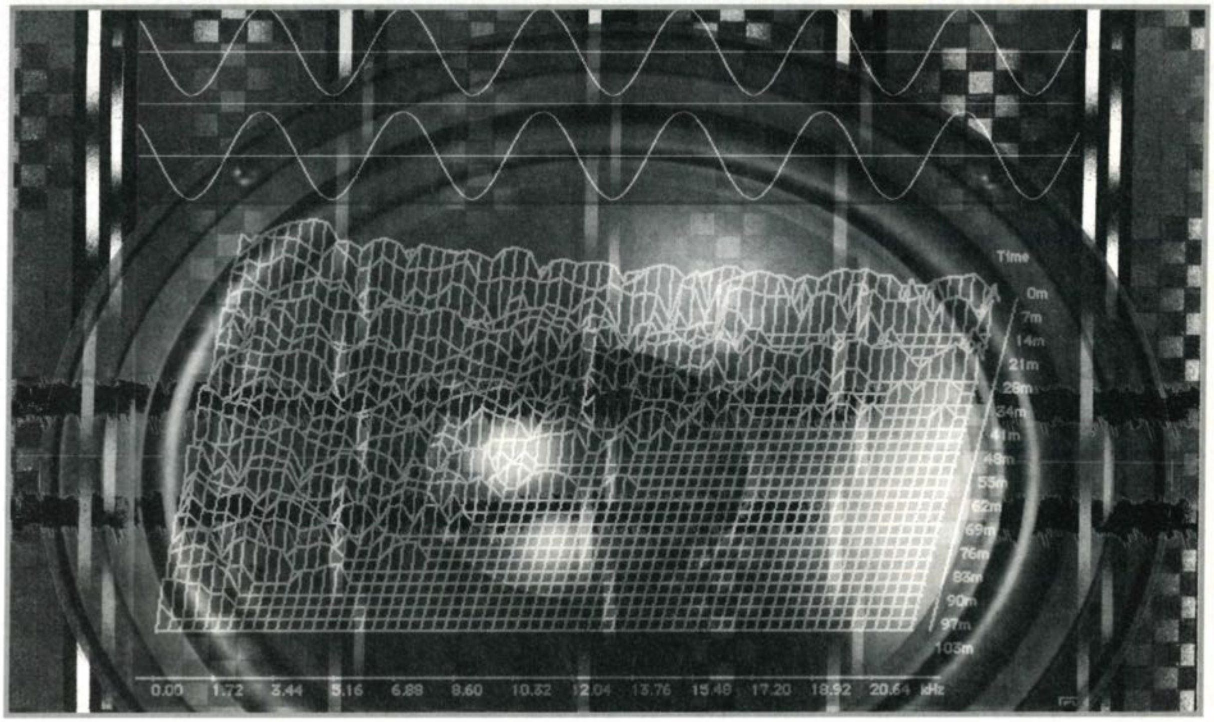


ILLUSTRATION: TIM GLEASON

DISCUSS THEIR METHODS

can be caused by path length differences between multiple drivers and can only be rectified by synchronizing arrival times, either by delaying components or realigning multi-element arrays. Reflections from balconies, rear walls and other architectural features can produce a variety of interference patterns, some of which can be dealt with by complementary equalization, some of which should be left alone. Of course, once the audience enters, increasing humidity and temperature and bringing in acres of absorptive surfaces, any analysis performed earlier in the day in an empty, cold hall must be considered suspect. But, provided the operator takes these and other factors into consideration, it is fair to say that judicious system equalization can improve the sound of most loudspeaker arrays in all but the most hopeless acoustic environments.

MEASUREMENT IS KEY

The key to successful system equalization is measurement. All measurement depends on standards, however, and until comparatively recently, the standards for

—CONTINUED ON PAGE 95

SYSTEM EQ EQUIPMENT CHOICES

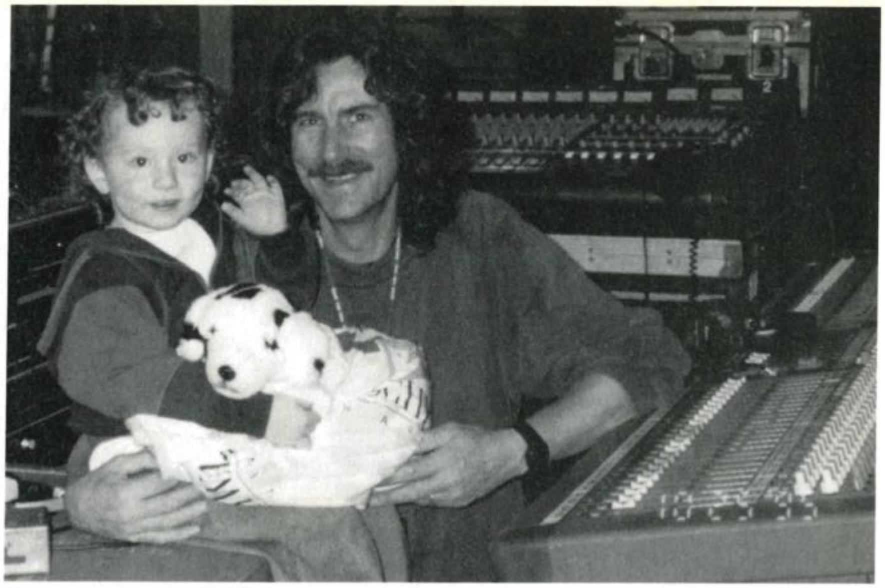
For system EQ, David Scheirman prefers digitally controllable units such as the BSS Varicurve or Klark-Teknik DN3600 that offer the facility to store and recall various EQ settings from memory. Ross Pallone is currently using the Yamaha YDG2030 digital graphic EQ. "I did some A/B tests between that and [another digital graphic], and I thought the Yamaha digital EQ sounded much better," Pallone says. "I use it as one would a normal analog graphic EQ, with the exception that in addition to being a graphic it has four notch filters that you can add on top of your EQ, so if I have a particularly bad frequency I can dial in that notch filter and pull it out." David Revel carries an Audio Control RTA, which he chose because it's battery operated and portable. "It's easy to use and fits in my briefcase," he adds. Other EQ units mentioned by interviewees include the Meyer Sound CP-10 complementary phase parametric, The Apogee Sound CRQ-12, Klark-Teknik's DN-405 and 410 and Richardson PL-5. ■

AN INTERVIEW WITH DAVID MORGAN

David Morgan has been a concert sound engineer for 20 years. A performing musician for 13 years before that, Morgan began mixing for an L.A. band called El Chicano in 1975. In 1978, Morgan went to work for the Doobie Bros. as part of the road crew and was mixing FOH by the end of 1979. His clients include Bette Midler, Kitaro and Lionel Richie, but his primary occupation for the last few years has been as Paul Simon's sound man.

Morgan characterizes himself as a "seat of the pants" engineer. Though not at all opposed to the appropriate use of test and measurement equipment, Morgan equalizes his sound systems by ear. "I'm not a guy who flies a 747, I'm more like a guy who flies an old biplane. I do it the old-fashioned way—I listen," he says. Morgan's views on production values are also traditional: "[As a mixer] you're out there as a representative of the band, and you have a responsibility to give the ticket buyers what they paid for, which is a good clear shot at hearing the artist that they love, and you're also there to get them to come back the next time. The ticket buyer is the reason you're out there in the first place. Those of us who make our living in rock 'n' roll have been given kind of a gift life. We should take full advantage of that gift and try to give some of the good energy back and give everyone as good a show as they deserve. I try to take my ego out of the setup of the system as much as possible."

The following conversation offers a fascinating glimpse of the working methods that have rightly brought Morgan three TEC Award nominations, the respect of his peers and compliments from satisfied audience members around the globe.



David Morgan and son at the board

What kinds of rooms do you feel you have the most experience with, and which do you prefer?

I've done as many arenas and stadiums as anyone; I prefer a nice-sounding arena to almost anywhere else in the world. I like the energy you get from a big crowd of people having a good time. There's some nice-sounding arenas here in this country. My favorite sports arena for music here in the U.S. is the Palace in Auburn Hills. You can make that place sound just like your living room. A lot of people don't like doing the bigger venues, and make up all sorts of reasons why they're awful, but I have a good time doing them. I even like stadiums. I just like the way the performers relate to the crowd.

What's your method or technique for room tuning?

My method is to put on a routine of songs. I start with "The End of the Innocence" by Don Henley. I listen to that one because it's got some pretty unfriendly bottom end to it between 60 and 100 cycles. It's not a beautifully recorded bass or kick drum. It does, however, tell me how much energy in the room I'm 'allowed' with my bottom end. That's the first test: How much of the 18s in the S4s—I use Clair Bros. most of the time—am I allowed in this particular room. That song'll tell me before I'm done with the first two measures. I know where that crossover's going to go right away. Sometimes you just reach for it and rip it all the way down, and then back it back up, and sometimes go, "Oh, the low end's not too bad in here; maybe I can leave it up."

"My choice of songs is based as much on their sonic deficiencies as their sonic advantages. I don't play these songs because they're perfect recordings; I play them because they're perfect for what I'm doing."

I don't try to impose my will on a room. I'll take what the room gives me. I don't come in with a preconceived idea of what the show should sound like in any given venue in the world—that's wishful thinking. If you try to cooperate with the room and take what it gives you, and base your performance on your physical surroundings, then I think you get a much better result. If you've got a room that's resonant in the low end, there's no sense leaving the bottom end up where it's just going to overpower your mix all night long. You're going to be fighting it just because you want that great kick drum sound. What I want the P.A. to do is not as important as what the room will allow.

You mentioned turning down the crossover. Do you turn down the bass or fiddle with the crossover frequency?

It can be either, depending on the crossover system. With Clair's CTS system I can't get into it and move the crossover, so it's a matter of turning it down. Some people look at a crossover and figure that you have to start with all the knobs at the 12 o'clock position, because that's what the manufacturer recommends. The first place I start EQ'ing is at the crossover. If I can't get it right, then I'll start playing with the ⅓-octave. So I try to do very slight adjustments with the ⅓-octaves because I'm worried

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about bass coherence. No matter how good a ⅓-octave is, there's only so many filters you can go through with different gains at adjacent frequencies—otherwise your phase is just going to fall apart. A cut or a boost—well, I hardly ever boost—a cut of 6 dB is a lot for me. I try to do it mostly with shaping. Instead of big 12dB cuts, I'd rather do a little "smile" here and there.

Next I go to the fourth cut on that Don Henley album, "The Last Worthless Evening," which is the exact opposite—it has a nice, tight kick drum and a nice bass guitar. Henley's vocal on it is screechy in the 2 to 4kHz region, which it is naturally—Don's got a lot of serious overtones in that neighborhood. This is certainly not meant as any criticism of his voice, it's just what I hear. At that point I'll start going through the upper midrange and smooth that out. Usually the two anomalous areas in the room will be in the extreme lows and upper midrange area, the real "barky" area. We all use 2-inch exit HF devices, and a 4-inch diaphragm will always have a problem due to physics in that 2 to 3kHz range. That's where ear fatigue comes at a concert. You've got to get that range right.

Then I take that CD off and put on Lyle Lovett's *Pontiac,* and I listen to "If I Had a Boat," which has really beautiful HF on it. The high end and reverb on the acoustic guitar and the sparkle on his voice—that's a beautiful recording, direct to digital 2-track, I believe. There I'm listening to what's going on above that obnoxious 2 to 4kHz area and to see what's going on in the overtones if they're coming through. If not, maybe I have to take out more in the 2 to 4kHz range and then push the HF in general.

A lot of wireless microphones seem to have a node around 6.3 and 8 kHz. You often have to take a little of that out of the P.A. This Lyle Lovett cut lets me know what I'm going to have to do with the vocals. If it's really pingy up there in the 8kHz range, I'll have to take a little out.

After I get through that part of my judgment process, I go back to lower midrange and do the 400 to 1k Hz area [with Lovett's voice as a reference]. Lyle's got a big 800-cycle product in his voice—real nasal. There's a song called "L.A. County" on the same album that has pretty layers of acoustic and electric guitars—if I can hear all three parts perfectly then I know I've got the balance in the high-end correct.

The next song I put on is "More Than This" from Roxy Music's *Avalon.* We're talking a little lower low midrange in the 300 to 600 range. If I can understand Bryan Ferry mumbling, if I get good articulation, then I'm doing really well. Then I'll put on the track "Avalon," which has a great bottom end on it. That's a nice overall assessment of how the P.A. is operating. Then I'll go back to the Henley record and put on "Heart of the Matter," just because I love it [laughs], and I'll play it really loud. If it sounds good really loud then I've done a good job.

Those six or seven cuts do basically what I need to hear out of a room. It's an extremely personalized way of looking at the output of speakers, but it's something I can relate to and it's things I know really well. On "The End of the Innocence" we all know what Bruce Hornsby's piano sounds like—it's in your blood. If you can make it sound like a cross between an RMI and a small Yamaha grand, then you're pretty close!

What equalizers are you using?

I use the TC 1128 programmable EQ, which I've become addicted to. I can't remember how it was possible to move faders on multiple graphics all at the same time before.

You do the same EQ on multiple parts of the system at one time?

Trying to match left to right was always a problem when you had faders with

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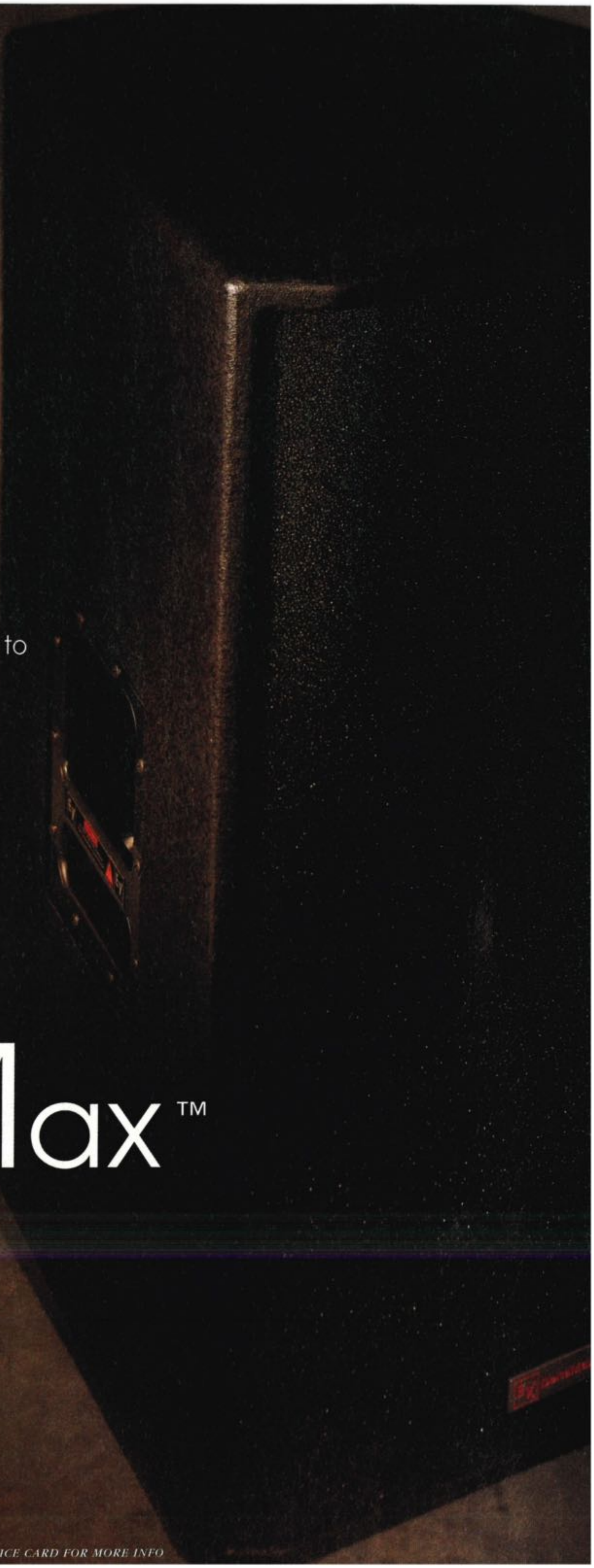

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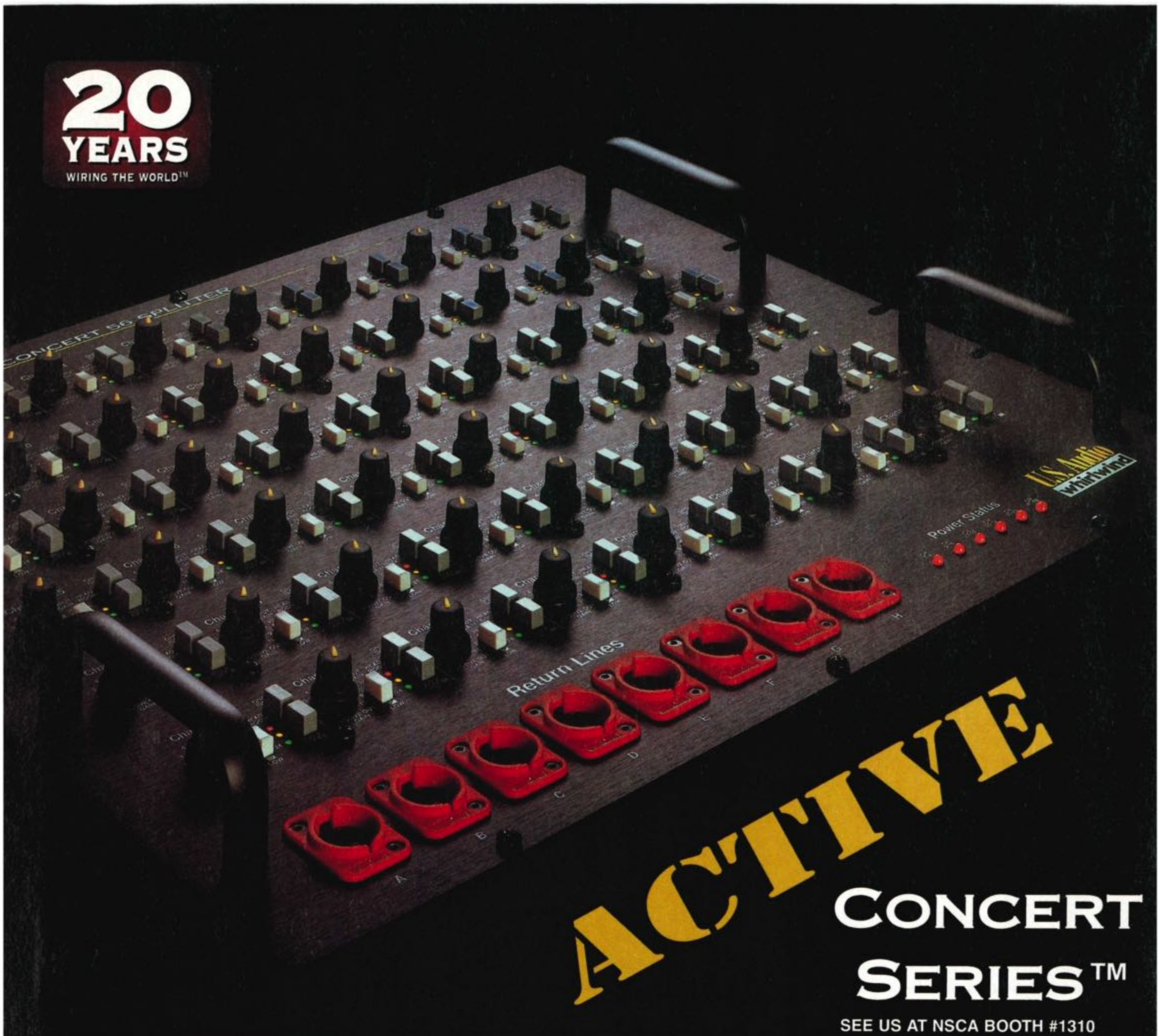

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slightly different tapers. If you're using a couple of conventional graphics and park the fader on the silk-screen, you never know if it's right. You might be a dB or two off. The tapers on any given faders are never the same. When you're controlling a left and a right with a pair of TCs and you take 3 dB out at 400 on each side, you can be secure that it will happen.

With Clair Bros. you have F cabinets and P cabinets. P cabinets are the top row, long-throw cabinets, and the F cabinets are the old classic S-4-style short- to medium-throw cabinets. Then you have various groundfill cabinets. I'll usually have four stereo pairs out there that I have to work on. The TC really helps, it just moves you faster.

Do you have to play the songs several times to get each section of the P.A. sorted out, or can you do it one run through?

I'll do the short- and medium-throw first, and repeat certain of the tracks for the long-throw rows. The frontfills almost always stay the same—we're talking near-fields. However, if you have an obnoxious frequency that you take out of the main P.A. then it behooves you to take it out of the near-field stuff as well. The closer you are to a sound source, the less you need to EQ it or change it once you have it where you feel it sounds reasonably good in a free soundfield.

You haven't mentioned that you play any Paul Simon CDs.

No, I don't. Sometimes I'll play a Ladysmith Black Mambazo cut, the guys who sing a cappella, to check out vocal decay and articulation. I'll play that at Carnegie Hall and find out about intelligibility with multiple voices. I don't play Paul Simon. Paul's studio records are so contoured—Roy Halee does an amazing job. What a great engineer and producer. Every song is so unique-sounding that for EQ'ing a P.A., it's really something you'd want to play after you've finished. There's so much depth, stereo placement, that the subtlety would never come through if it was the first song you played in an untreated 18,000 seat arena. If you want to hear the AMS reverb on the toms on "Diamonds on the Soles of Her Shoes," you ain't going to hear it when you first turn the P.A. on in a big old ugly room. All you'll hear at Wembley Arena is Big Red, the old back wall.

My choice of songs is based as much on their sonic deficiencies as their sonic advantages. I don't play these songs because they're perfect recordings; I play them because they're perfect for what I'm doing.

How long did it take you to arrive at this list?

I've been using this list since *The End of the Innocence* came out—that was my latest addition. I used *Toto IV* for a few years. A lot depends on whether or not it satisfies the criterion for salient frequencies. For a while there were a couple of Doobie Bros. cuts I played. I've used various artists, but this particular combination has been working great for years. I just have a couple of DATs with me with these songs in order. I've added a few songs at the end. After I do the Roxy Music or "Heart of the Matter," I like to put on Vince Gill—a song called "Trying to Get Over You" on the *I Still Believe in You* record. It's a gorgeous recording. That's something you can put on after you're done with the EQ. Incredible reverb depth on his vocal and the snare drum. The layers of his vocal are so beautiful, and the piano's recorded really well. I'm a big Vince Gill fan, and that particular song does a lot for me.

On *Joshua Judges Ruth*, Lyle Lovett's fourth record, I believe, there's a song that George Massenburg put an amazing amount of bottom end on in the 20 to 30Hz region. It really shakes. It's called "She's Already Made up Her Mind," and that song is a nice one to sneak in when the crowd's in the building right before the show to see how much absorbency I've got from the crowd in the extremely low-frequency range and see if I can turn up the 18s—I might have been timid about them earlier in the day when it was empty. There's a few songs I'll play in the half hour before the show if the artist is amenable—sometimes they demand that you play a specific program of walk-in music.

When you can choose, what kind of walk-in music do prefer?

I like to put on African music. I think it puts people in a good mood. A lot of the guys in Paul's band have done solo records, so I'll put on a lot of their stuff—that's always fun. The African stuff—there's a lot of syncopation to it, so I can actually here how much definition I'm getting out of the room.

Any pitfalls to your method of doing room EQ?

I've had pretty good results with it. The only pitfall is if the mixing position is totally unrepresentative of the rest of the room. I'm mostly doing arenas and stadiums so I usually have a good mix position exactly where I want to be. If I'm in theaters, I may have a problem. I did Kitaro in theaters last year, and that was really enjoyable—that man does beautiful music, and he's really a prince to work for—but they stuck me under balconies all the time, so thank God for the 100-foot cable on the TC Electronic remote head so that I could sit in the good seats and listen. The caveat of my method is that if the mix position is awful, then you're in trouble. I just finished doing Ms. Ross at the Super Bowl half-time show, and the mix position they gave me there was as bad as it possibly could be. I had absolutely no reference—it just sounded horrendous where I was. Plus I was in front of a beer stand and a major rest room area, so I had screaming drunk people around me all the time. Not only could I not hear the P.A. in a representative fashion, I could hardly hear it anyway. But it sure turned out well. Diana sang the show live—one of the few times anyone has sung a modern half-time show live—and it came off really well. We were all extremely pleased with the way the EAW system performed. ■

—FROM PAGE 89, SYSTEM EQUALIZATION

loudspeaker performance tended to be theoretical, even fanciful. Touring systems made up of separate bass bins, mid horns and tweeter boxes were inevitably set up slightly differently at every venue. Any misalignment of HF horns relative to mid woofers, for example, might result in cancellation rather than addition at crossover frequency. As a result, it was often hard to separate the variables of sound system performance from the effects of room acoustics.

However, by moving to the integrated modular systems approach—all the drivers in one box with associated and dedicated control electronics—manufacturers have been able to eliminate the alignment variables inherent in component systems and can now produce full-range systems that consistently meet specifications. Ken DeLoria, president of Apogee Sound (Petaluma, CA), dates his interest in advanced analysis and system equalization to complaints from customers that their Apogee systems sounded different in different environments. He knew that his integrated speaker systems performed consistently, so he focused his attention on the system/room response.

"We all know that the room plays a big part in how any loudspeaker

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sounds," says DeLoria. "But what I learned is that the room can make a far greater difference than I ever realized... before I started carrying instrumentation around and making actual measurements." DeLoria found that the effect of an acoustically hostile environment on his loudspeaker systems "could be of an order of 20 to 30 dB in the low end."

The measurement system DeLoria developed, Apogee Sound's CORREQT, allows the operator to use music as a reference source, as do Meyer's SIM System II and the PREq (Precision Room Equalization) system from the Solstice Company of San Rafael, Calif. All three systems make use of digital spectrum analyzers operating in the Fast Fourier Transform (FFT) mode in order to compare amplitude and phase response vs. frequency between two sources, typically the output of the mixing console and the input from several measurement microphones. Not surprisingly, some training is necessary in order to operate CORREQT and SIM systems correctly (PREq is offered on a consultancy basis only), and the designers of all three systems are quick to point out that faulty analysis of the data can lead the operator to make changes that can exacerbate the original problem.

POPE ON A 'SCOPE

Despite their expense and technological complexity, SIM, CORREQT and PREq systems are gaining wide acceptance. Trained SIM operators are frequently called in for Broadway musicals and are often included in the sound crews for traveling cartoon-characters-on-ice shows. David Scheirman of Concert Sound Consultants (Bainbridge Island, WA) regularly designs sound systems for large-scale events and notes that some crews regularly include what he refers to as an equalization technician, or ET. Under Scheirman's definition, the ET's entire responsibility is to set up, calibrate and operate a measurement and analysis system and provide the sound system chief or mixer with information about the unique acoustical properties of the performance space—information that includes how the system is responding in that space and how the system response is affected by equalization.

"There's a general trend at higher-end, more complex events to have a dedicated ET," says Scheirman, who will on occasion specify an ET for his projects. For Pope John Paul's 1995 appearance at Giants' Stadium, Scheirman designed a 22-zone speaker system based on Meyer Sound loudspeakers, some of which were 1,000 feet apart. "To me, one of the most appropriate things to do was to have a SIM technician there on site," says Scheirman. "SIM is a labor-saving, time-saving procedure and a proven technique that allowed us to analyze and adjust a very complex system in the shortest amount of time."

> **"If it is the opening and closing ceremonies for the Olympics, if it is the Academy Awards, if it is a presidential inaugural ball, you're going to have a lot of reasons to have precision system adjustment. The whole world is watching and listening..."**
>
> **—*David Scheirman***

Acknowledging the additional expense of adding an ET to the crew, Scheirman explains that "if it is the opening and closing ceremonies for the Olympics, if it is the Academy Awards, if it is a presidential inaugural ball you're going to have a lot of reasons to have precision system adjustment. The whole world is watching and listening, due to media coverage." Scheirman notes that crews and producers in broadcast and remote trucks will be able to hear things in their acoustically isolated control facilities that may go unnoticed at the FOH mix booth. "They can hear how your sound reinforcement system is energizing the acoustical space through their audience mics," he says. "These specialized EQ systems give the sound reinforcement engineer an effective way to deliver the best, most palatable product that does not interfere with the broadcast and media hookup and the overall media presentation of the live event."

It should be stressed that though modern instrumentation techniques for measuring system/room response can be very accurate, different techniques require different skills and may not always be suited to the application. "Once I am dealing with an entire loudspeaker array I find measurement tools—at least the ones that are available to me on a regular basis—are not as accurate as using my ears," says David Revel. A professional sound man for almost two decades, Revel has recently been working with jazz artists such as Lee Ritenour and Chick Corea and has directed multimedia events for Pepsi-Cola, Lexus and other corporate clients. He has also worked on Concert Sound Consultants' projects with Scheirman for the New York Philharmonic, the Metropolitan Opera and the Korean Liberation Day Celebration in Seoul, Korea.

Revel notes that acoustic problems caused by path length differences and comb filtering are particularly tricky to identify correctly. "Using an RTA with only ⅓-octave resolution can really lead you astray more than it can help you," he says. As Meyer's McCarthy explains, "SIM II requires a lot of experience and training. RTA requires no experience and training, but it also can't get you very far. With RTA, you're seeing a minuscule part of the picture, at low resolution, and [you're looking at] amplitude only." (By contrast, FFT-based methods allow the operator to examine many more aspects of the sound system performance, such as the phase response and time arrival of different speakers, as well as amplitude at every frequency with resolution of up to 1/24 octave.)

David Morgan is also skeptical of the pink noise/RTA method. "I don't use ⅓-octave analyzers, SPL meters, anything other than my ears," says Morgan, FOH mixer for Paul Simon. "I used to. When Ivie came out with that portable handheld ⅓-octave analyzer in '78, I tried using that for a while. I'd build myself a gorgeous-looking curve, but when I put music on it would sound awful. Why bother?"

Scheirman emphasizes that the system chief or FOH mixer is still ultimately responsible for the sound quality. "If the ET is there to perform a service and defer to your creative judgment, then the outcome is probably going to be more favorable than if the person is there to explore the outer limits of the unique technology that he or she is still perfecting," says Scheirman. "But if you have the budget and a compatible person to work with, [using an ET] is always worth the effort."

Revel agrees. "I recently had the op-

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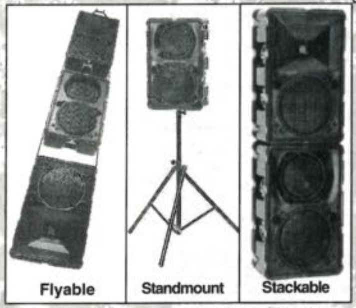
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portunity to work very closely with a SIM operator on a show I did in Las Vegas at the MGM Grand Garden and was very impressed with the ability to look at the entire system as a whole with much greater resolution than with a ⅓-octave analyzer," says Revel. "Given my druthers, I'd like to have a SIM system at every show."

TONES AND TUNES

Of course, not every system setup is as demanding as a Papal Mass in a football stadium, and many clients have much more stringent budget considerations. What does Scheirman recommend when SIM, CORREQT or PREq are not realistic options?

"The very first thing that I typically do is give the system a swept sine-wave input, sweeping from highs to lows, to confirm the power-band response of the system," says Scheirman, naming Gold Line's Loftech TS-1 variable-tone oscillator as an affordable and useful test tool. When working as an FOH engineer employed by the client/performer, Scheirman typically relies on the sound company's system engineer to perform test functions and ensure that the system is working up to specifications. After he has established that the system has flat power-band response—"meaning the lows, mids, and highs have the proper relationship to each other"—and that multiple zones are in the correct time relationship with each other, Scheirman plays a CD.

"One that I've had good success with is called 'I've Got the Music in Me' by Thelma Houston," says Scheirman, referring to a direct-to-disk recording first issued on vinyl in the 1970s. "Direct-to-disk recordings have the highest possible quality with the least distortion and [are] the best way to simulate live music without having to inconvenience all the artists early in the day to do a very extensive sound check just to confirm that the system drive components are adjusted properly."

"I like to start by looking at one individual speaker box—that may be a three-way or four-way box, depending on the system," says Revel. "I start by turning on one speaker cabinet, all by itself, and measuring that cabinet. I generally use pink noise and an RTA because I don't always have access to nice tools like SIM and TEF. I try and make the response of the one cabinet as accurate and relatively flat as I can, and then I go on and turn on the rest of the system and use various CDs and music program to tweak the response of the array as a whole. I try to pay a lot of attention to how I stack the speakers in order to minimize coverage overlap and the comb filtering that comes with that. But at low frequencies, obviously, one can't have a lot of effect on that."

> **"I just sit there and listen all day long—what it sounds like when somebody drops a shackle or a piece of plywood. You can learn a lot about the frequency content of the room...just by listening to the sounds of people talking, yelling, things dropping, wheels rolling..."**
>
> ***—David Morgan***

All of the FOH engineers I spoke to use recorded music as a test source and all have particular preferences. (See the David Morgan interview sidebar for a revealing look at how music can be used as a test signal). Ross Pallone's reference mix is *The Nightfly* by Donald Fagen. "I've been using it for twelve years now, ever since I started doing live sound," says Pallone, who began his career in recording studios and went out on the road with Michael McDonald after recording his second album. Pallone is now FOH mixer for John Tesh, and was nominated for an Emmy for Tesh's "Live at Red Rocks" TV special, which Pallone also recorded. "There's not a lot of effects on [*The Nightfly*], it's not real wet, and I know exactly how the highs and lows should sound coming off of that CD. If there's an RTA in a room I'll look at it, but it's not a necessity for me," Pallone says.

Revel generally picks a CD similar in musical style to the program that will be played at the event. "So for example, if I'm doing a jazz show with Lee Ritenour, I would probably pull a Lee Ritenour CD. If I was doing a show with opera or classical, I would use an opera or classical music CD," says Revel. In addition to the Thelma Houston CD, Scheirman recommends playing recorded speeches by "a good, fiery orator who is trying to address a large crowd through a microphone." Malcolm X and Martin Luther King Jr. are good examples.

How long Revel spends on system EQ depends on the situation and his role. "If I'm the band engineer just coming in at a festival, then not more than fifteen minutes to half an hour," he says. "If I'm the systems engineer for a large festival and I get to start from scratch, I've spent as long as three to four hours, sometimes longer, depending on the situation." Pallone works fast. "In a typical situation, where I'm carrying my own P.A. system, I can do it in about ten minutes," he says. "If I patch into the house system and they have under balcony fills and high balcony fills, it'll maybe take me about twenty minutes or so."

Like most professional touring engineers whose travel arrangements make it possible, Morgan likes to spend as much time as he can setting up his system EQ. "I come in at rigging call," says Morgan. "I don't come in at four in the afternoon with the band. I ride on the bus with the crew. I go over the P.A. with the sound company guys, what we're going to use, how we're going to use it that day, at rigging call, whenever that is. Once we've determined how the P.A. is going up and the guys don't need my help, I just sit there and listen all day long—what it sounds like when somebody drops a shackle or a piece of plywood. You can learn a lot about the frequency content of the room and you can have the room pretty much pre-EQ'd in your brain just by listening to the sounds of people talking, yelling, things dropping, wheels rolling—there's all sorts of little things you can have already cataloged in your mind before you even touch the P.A."

BASS BUMP FOR POPS

Revel also rehearses EQ in his head. "I try to form a picture in my head of what I want the system to sound like, and so once I've got this basic flat response for a single cabinet then I listen to music and listen how the array interacts," he says. "For example, with popular music I may keep the bass bump that happens when you array many woofers together, because that helps me. But for classical music that may not help me, and it may actually hinder me, so I'll try to EQ that back out."

How much EQ Pallone uses depends on the room. "If it's a good-sounding room, I have to do very little—I might only take out at maybe two frequencies," he says. "The worse the room, the more I have to do. The worst thing is long low-end decay. It doesn't seem like there's much you can do about that—it's just there and no matter how much you take out it just seems to stay there. This gives you a problem in that you don't want things sounding too thin coming out of the P.A. cabinets for the audience that's up close."

•••

In addition to those mentioned in the article, the author would like to thank Mark Frink, Alexander Yuill-Thornton II (Thorny), Don Pearson, John Murray, Sam Berkow and Chips Davis. ■

Chris Michie, Mix's technical editor, is a former live sound engineer and has toured with Pink Floyd, Roxy Music, Sarah Vaughan, Mel Tormé and others.

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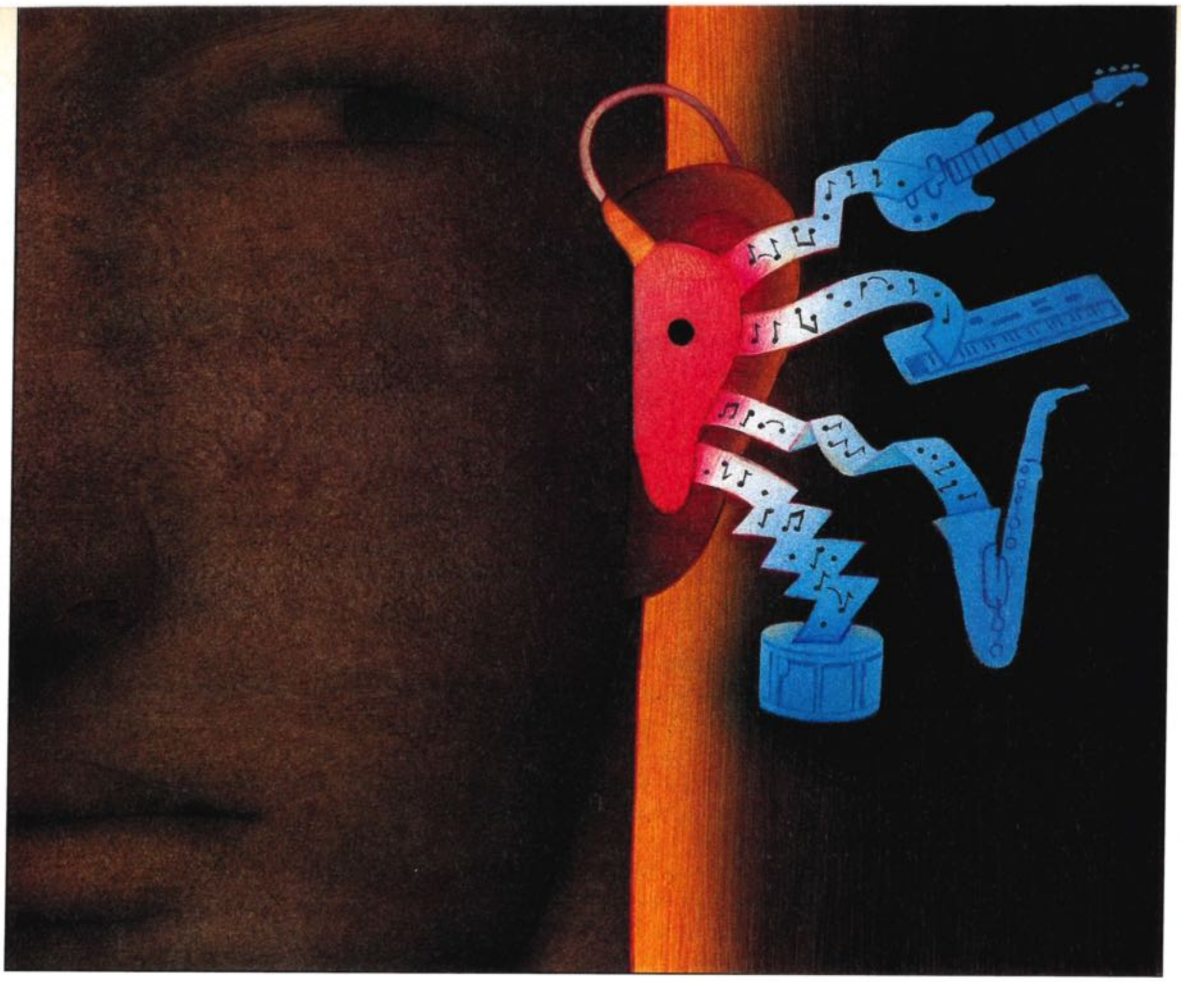
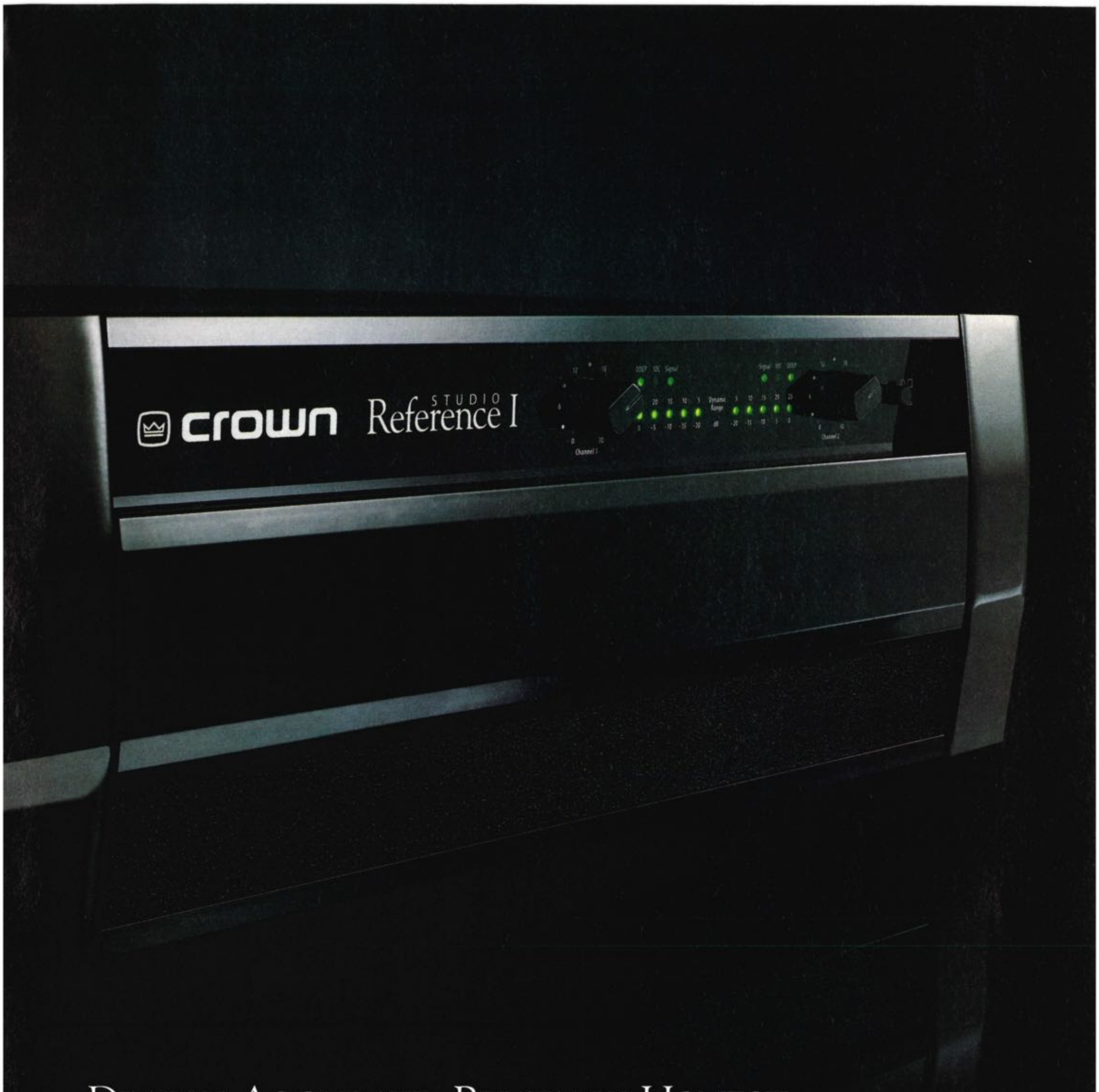


BY STEVEN E. McCALE

Earphone Monitoring BASICS

Earphone monitoring systems represent the future in stage monitoring. Earphone monitoring (also known as in-ear monitoring, at-ear monitoring and ear monitoring) allows the monitor mixer to exert complete control over what is heard onstage and nearly eliminates the adverse effects of room acoustics and loud onstage instrument levels. The use of ear monitors instead of traditional wedge and sidefill monitors may not only improve sound quality and performance, but they can also protect and conserve the hearing of everyone involved—musicians, sound engineers, other production personnel and the audience.

ILLUSTRATION BY JAMES ENDICOTT



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Properly implemented, ear monitoring eliminates the need for multiple monitor speakers spread out across the stage. This reduces ambient noise and makes cleaner, more dynamic FOH mixes possible at lower levels. Live recording and FOH engineers no longer have to deal with drum overheads picking up more of the drummer's monitor cabinet than the cymbals. Singers no longer need to push their voices to the point of damage in order to hear themselves over the P.A. and guitar amps. The lead vocal sound is no longer colored by the unavoidable "hollow" quality characteristic of loud monitors operating just below feedback. Lower transportation costs, less stage clutter, better communication and greater freedom of movement for the performer are just a few of the many additional benefits.

However, many artists and bands have abandoned in-ear monitoring after an initial unsatisfactory experience. In this article, I hope to show that with proper setup and a little foresight, artists in all genres can enjoy the full benefits of the in-ear experience.

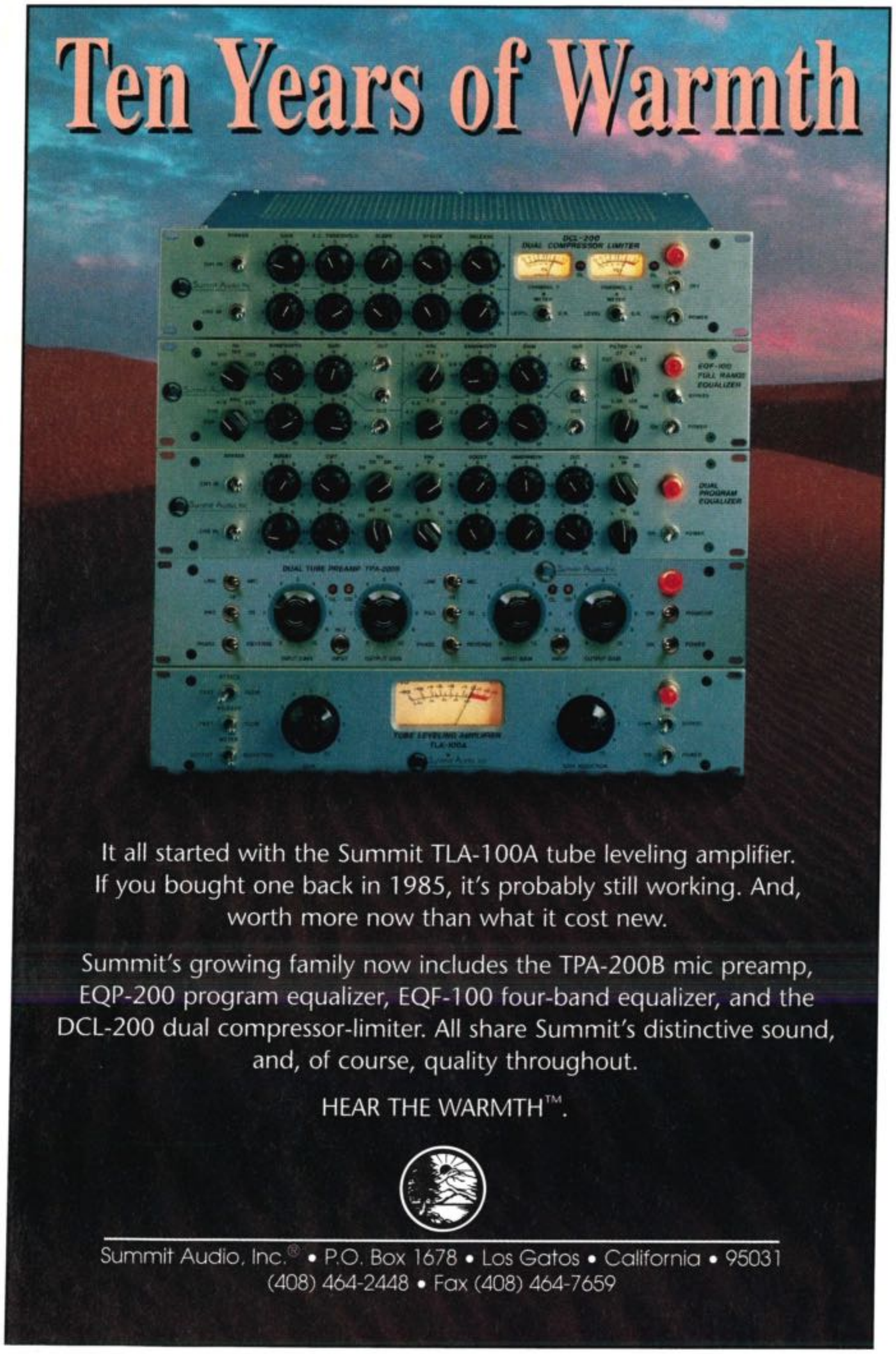
DETAILED MIXES AT LOWER SPLS

If the ultimate goal of the artist is to impress the audience, then making sure that every ticket-buying customer hears the best possible show is a step in the right direction. With no wedge and sidefill monitor spill to overcome, the FOH mixer can get a great sound at lower SPLs. Further, by isolating musicians' stage rigs, engineers can eliminate the backline wash that typically bleeds into every mic onstage and into the audience. (Of course, you don't have to use ear monitors to put the guitar amps backstage, but the isolated instruments will have to be fed back to the musicians in a monitor mix, whichever system is used. Using ear monitors avoids the situation in which the onstage instrument monitors re-create as much spill and background noise as the banished instrument amps.)

With most of the "stage wash" eliminated, the FOH mixer doesn't have to run the house sound system as loud. We all know (or should know) that the ear will protect itself by "shutting down" when exposed to loud noise. Conversely, when exposed to lower levels, ears "open up" and remain sensitive to a greater dynamic range. A house mix that makes use of this increased dynamic range can take on a quality that compares with the dynamic range of digital recordings. With increasing live sound SPL regulations and today's focus on hearing conservation, the ability to preserve dynamic range and create detailed mixes at lower SPLs could be the single most important benefit of ear monitoring.

Artists who learn to use ear monitors properly will notice that the quality of their performance is enhanced. Correctly designed and fitted earphones seal out the ambient noise of the audience, backline and P.A., as well as unwanted acoustic reflections. A loud, clean sound is easy to achieve in that quiet environment, and in-ear monitor mixes can be incredibly consistent and precise. The apparent volume is the same, but the actual volume can be much less. The result is a sound that is easy to listen to night after night, and doesn't leave ears ringing.

Timing and pitch are also improved. Sound takes time to travel even short distances. It takes about 50 milliseconds for the sounds from wedges and sidefills on one side of the stage to reach the other side. Sounds arriving at



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different times create timing and pitch problems for musicians (many chorus and doubling devices use delay times of 50 ms or less because of the "fattening" and slight detuning effects of short delays). The slightly "sloppy" sound of a traditional monitor system combined with venue acoustics makes it difficult to achieve the precise "studio" sound that many bands now seek. With monitor speakers actually at their ears, everyone hears everything at the same instant, eliminating timing errors or delay-related distortions.

Another advantage of ear monitoring is the ability to create true stereo monitoring for performers. Even with two wedges, an artist must be in a precise location, and be playing solo, to get a real stereo mix. With earphones, everyone is always in the sweet spot. To the artist, this means a cleaner, more intelli-

PERSONAL MONITORS

WHAT YOU SHOULD KNOW

by Michael Santucci

Affordable wireless and hard-wired systems are making personal in-ear monitoring systems, until now used mainly by top touring acts, available to a broader range of musicians and engineers. Improved and consistent sound quality, reduced feedback and freedom of mobility are just a few of the many advantages emphasized by manufacturers, and most claim that their products provide high-quality audio, with hearing safety built in. However, hearing safety is often minimized or misunderstood. Before committing to this emerging technology, product safety and quality should be carefully evaluated.

It is no secret that exposure to high sound levels from conventional stage monitors may cause irreversible damage to the inner ear, resulting in permanent hearing loss and tinnitus, or ringing in the ears. Personal monitoring devices, though miniature in size compared to stage monitors, are still capable of producing harmful levels of up to 120 dBA at the eardrum. However, with proper use and the guidance of a well-informed audiologist, they can allow a performer to hear the full dynamic range of music, while protecting the ear from permanent hearing damage.

After intensive training in the science of hearing and hearing loss, the majority of audiologists hold a master's degree, and some go on to complete a doctorate. Unfortunately, most audiologists have little or no experience in dealing with the special circumstances and individual needs of musicians, let alone sound reinforcement technology. Current college curricula do not educate the audiologist in hearing protection strategies for rock musicians. A well-informed audiologist who specializes in working with musicians has probably invested extra time to understand both the applications of personal monitoring devices and the integration of hearing protection strategies.

Make the effort to locate an audiologist with expertise in the safe use of personal monitors. Ask specific questions: "What are the qualifications of the professional taking the ear impression? How can a personal monitor protect hearing? What is the maximum SPL of the transducer? Can the volume of this device be measured during rehearsal? How long can this personal monitor be worn, and at what volume, before there is a risk of damage?"

An effective strategy for protecting professional ears should include a case history, a hearing test, the use of peak limiters, the measurement of sound levels in the ear, plus an understanding of the use of personal monitors as protective devices.

A confidential interview with the audiologist provides them with important information about the specifics of past stage monitoring, individual hearing problems and possible medical conditions that may restrict the use of monitor placement in the ear. This information assists in the selection of the appropriate personal monitor.

A hearing screening test is essential and highly recommended. An initial hearing test serves as a baseline for future tests and takes only a few minutes. Regular testing

—CONTINUED ON PAGE 106

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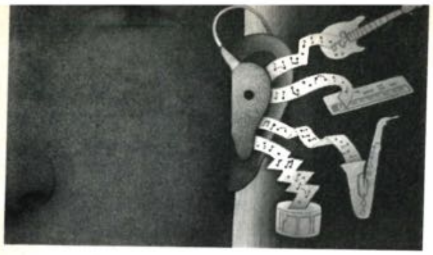

erful tool for hearing conservation (see sidebar). The loudest levels generated by earphones, although potentially damaging, are not nearly as loud as those that modern 2-inch compression-driver wedge systems routinely produce. In an all-ear monitoring setup, with no wedges, feedback is all but impossible. If you also factor in the reduced exposure to the close-range effects of cymbals and Marshall stacks, it becomes obvious that an earphone system can be inherently easier on the ears.

However, a great deal of attention must be paid to protecting everyone's hearing and exposure time, and levels must be monitored properly to avoid hearing loss. Always use quality peak limiters as the last link in the chain, and set them to provide a maximum program level ceiling, as well as "spike" protection. Hearing safety is of the utmost importance and should not be taken lightly.

RELAX AND ENJOY

Once your production is accustomed to ear monitors, you will begin to experience some of the benefits. Performances will tighten, crowd response will improve and you won't leave the venue feeling as though you've spent the day working too close to a jackhammer. After a few weeks, the biggest question remaining will be, "Why didn't I do this years ago?" ■

Steve McCale, an engineer who has worked in the music industry for 20 years, is president of Soundproof Enterprises Inc. (Kimberling City, Mo.), a pro audio consulting and design firm that specializes in providing personal monitoring devices for sound reinforcement. E-mail to soundprf@cmaster.com.

—FROM PAGE 103, PERSONAL MONITORS

is the only means to measure the effectiveness of the personal monitor as hearing protection. A new test, otoacoustic emissions (OAE), may provide early indication of outer hair cell damage, even before conventional tests show any significant decrease in hearing.

Some audiologists are equipped with miniature probe microphone technology, which can measure sound levels at the eardrum. Used during live rehearsals, this procedure establishes personal guidelines (OSHA or ISO) to eliminate damage caused by improper use. The technology enables the audiologist to direct the performer to the appropriate sound level for the daily number of hours the monitors will be used. This is the only method able to demonstrate and document the loudness of the personal monitor in the ear during actual use.

The use of brick-wall peak limiters only protects the ear from trauma caused by transient spikes and pops. Although peak limiters are an important part of the safety equation, they cannot be relied on to regulate the volume of user-controlled headphone amplifiers. Long-term exposure to moderate levels over many hours is as dangerous as occasional short bursts. Although professional engineers should be able to reduce accidental exposure to brief transients, the greater risk to hearing comes from everyday use at unsafe levels.

As protective devices, custom-molded transducers offer greater acoustic isolation than generic ones. For proper protection, the personal monitor must be able to isolate the ear from ambient sound of the backline and P.A. This higher signal-to-noise ratio inside the ear canal allows the performer to listen clearly at lower levels. Wearing a consumer "ear bud" while listening to a Walkman on "five" in a quiet room may be sufficiently clear, but on a noisy street, the same program material may need to be on "ten" for the listener to perceive the same loudness, as ambient noise masks the signal. Unless the device fits inside the second bend of the ear and seals the canal, outside sounds will mask the signal and force louder monitoring. Any product with open sound ports and surface placement of the transducers will have a reduced ability to isolate from background noise.

Ear canals come in all shapes and sizes. A custom mold of the ear extends beyond the second bend of the ear canal and should be taken by an audiologist. First, the audiologist otoscopically inspects the ear canal for wax, debris or disease. A cotton or foam block is carefully placed near the eardrum, and silicone material is injected into the canal to find the shape of the ear. It is a painless but unusual experience. The ear impression is sent to the manufacturer where the shell is cast and the electronics installed.

Manufacturing techniques, transducer types, construction materials and service vary among manufacturers. Personal monitors can be made of soft material, hard acrylic or a combination of both. The following features are recommended:

- The canal portion should be soft to maximize comfort and deep to provide acoustic isolation.
- Testing in a 2cc coupler (the average volume of an ear canal) should be provided to document the product's consistency.
- A minimum 90-day warranty for manufacturing defects should be standard.
- Ear impressions should be retained for remakes.
- Choices from a variety of transducers, styles, materials and isolation capabilities should be offered to satisfy personal sound quality preferences and address individual hearing protection concerns.

It's safe to say that personal monitoring is here to stay. Audiologists now have adequate tools to direct musicians and engineers in the safe use of these devices and to implement effective strategies for prevention of hearing loss. Take time to investigate before committing to a product. They're the only ears you'll ever have. ■

Michael Santucci is an audiologist who has worked in the music industry for over ten years. He is founder and president of Sensaphonics Hearing Conservation (Chicago), which provides personal monitoring devices and hearing protection strategies through an international network of informed audiologists.

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SOUNDCHECK

SYN-AUD-CON LIVE SOUND WORKSHOP

PHOTOS: MIKE FULLER

ShowCo's Howard Page leading a group discussion

Syn-Aud-Con's seventh annual Live Sound Workshop took place during the three days preceding the Winter NAMM show in Anaheim, on the campus of Chapman University in nearby Orange, Calif. The workshop is in its second year of being ably hosted by Pat and Brenda Brown (following the retirement of the distinguished Don and Carolyn Davis). Sound reinforcement topics are presented by a staff of industry veterans, including workshop co-founders Will Parry and David Scheirman, Audio Analysts' vice president Albert Leccese, Jaffe Acoustics' director Dave Robb, Mick Whelan of JBL Professional and ShowCo vice president Howard Page.

The Live Sound Workshop is the only event of its kind in North America, providing novice audio engineers a unique sample of the latest techniques and technologies in sound reinforcement. Attendees include students; regional sound company owners and employees; system operators from churches, auditoriums, live music clubs and theme parks, as well as manufacturing engineers who recognize the need for up-to-date contact with this vital part of the sound industry. Special emphasis is placed on the hands-on aspects of setting up and using the latest sound equipment, much of which was on loan from manufacturers.

The core sound system used in the main auditorium was provided by Southern California's Sound Image. New consoles supplied by manufacturers included the Midas XL-200, the Yamaha PM3500M monitor desk and the Ramsa WR-SX-1, which was used with the main system. (Arriving a day early, I had the opportunity to become familiar with the SX-1; my review appears on page 146 in this issue.) Satellite systems downstairs were run off of splits from the main snake, using a 40-channel, four-way BSS MSR-604 II active splitting system. Consoles downstairs were the Crest Vx, Mackie SR 24•4, Soundcraft K-3 and K-1, along with auxiliary gear from Lexicon, Yamaha, Roland, Aphex and Drawmer. Wireless lavaliers from Sennheiser and handheld mics from AKG were used for lectures in the auditorium.

Group presentations were held in the mornings, with attendees choosing from two tracks of instruction in the afternoons. The first morning began with a thought-provoking sound business overview, a touring-business survey and a look at career opportunities in sound reinforcement.

After the morning break, a representative from the House Ear Institute in Los Angeles spoke on hearing conservation. Charlie Ennis Lahaie (whose article "Protecting Your Hearing" appeared in the January 1996 issue of *Mix*) cited several case histories to illustrate the

Live Sound Workshop staff. (L to R standing) David Scheirman, Albert Leccese, David Robb, Steve McCale and Pat Brown. (L to R seated) Howard Page, Paul Gallo, Will Parry and Mick Whelan.

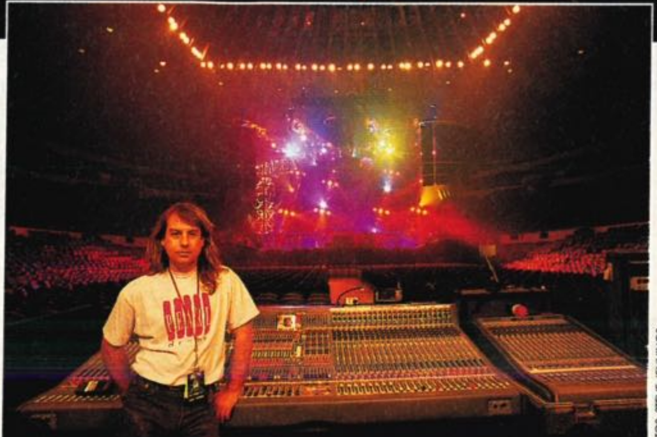
BY MARK FRINK

—CONTINUED ON PAGE 112

TOUR PROFILE

AC/DC
Live and Loud as Ever

BY SARAH JONES



AC/DC FOH engineer Paul "Pab" Boothroyd

PHOTOS: STEVE JENNINGS

The pimply faces of Beavis and Butthead are projected onto a screen suspended above a darkened stone wall facade. They are devising a plot to get backstage at the AC/DC show. After numerous attempts (and various distractions), they finally reach the backstage door; it creaks open, and a futuristic Amazon woman emerges and blasts the boys to bits with her space gun. The cartoon ends with the sinister image of a laughing Angus Young, devil horns sprouting out of his head.

Onstage, lights come up, illuminating a giant crane that descends upon the stone wall, a wrecking ball dangling from its steel arm. A low, ominous rumble builds as the massive ball swings closer and closer to the structure. With a final swoop, the ball smashes into the wall, which tumbles in a shower of fireworks and an explosive roar. Out from the ruins leaps lead guitarist Young, followed by the rest of AC/DC, and the opening riff of "Back in Black" thunders through the arena.

So began AC/DC's two-hour performance at the Oakland Coliseum in Oakland, Calif., a recent stop in the band's 1996 world tour promoting *Ballbreaker*, their first album in five years. *Ballbreaker* reflects AC/DC's return to its hard-edged rock roots and features the talents of producer

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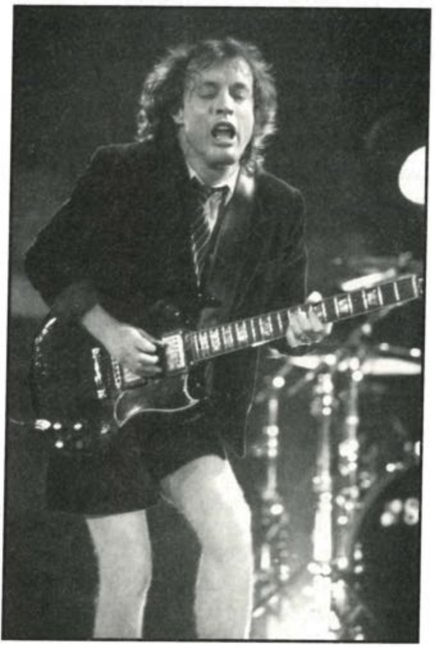
Rick Rubin and the return of original drummer Phil Rudd.

db Sound is providing the touring sound system, which includes a custom manifold setup with midrange driver modifications by db Sound and SSE. According to db, the Electro-Voice MT system is the latest version, with low-mid throat modifications for smoother response in the 400Hz region. The system size designation is 18 blocks, comprising 160 DH2A high-frequency drivers, 160 DL10X 10-inch speakers and 144 DL18MT 18-inch woofers. Crossovers are Omnidrives, and the system is powered by 36 Crest 8001 amps with an output capability of 100,000 watts.



PHOTOS: STEVE JENNINGS

Sound levels were not for the fainthearted: The 16 Marshall cabinets onstage generate a house SPL of 110 dB on their own (about 128 dB onstage). Add to that "30,000 watts of monitors, and they're all pretty much flat-out," according to monitor engineer John "Grubby" Callis. (Noting escalating litigation trends, crew members are only half-joking when they suggest that a noise disclaimer be printed on tickets.)

Callis, who mixes on a Midas XL-3, says he has it easy. "It's very simple up there; it's just a matter of beating the volume of the guitars. The drums have to be very loud. They don't use every channel up there; it's only drums—kick, snare and hat—and the vocals." Singer Brian Johnson wears a Garwood monitor in one ear; that mix includes vocals with some basic effects. He and the rest of the band rely on sidefills to balance the vocals and drums with the amps onstage. "The guitars are not in the monitors, obviously, because they're so loud," says Callis. "All I have to do is turn the vocals and drums up. And then we have to work it out so I don't affect Pab too much."

AC/DC monitor engineer John "Grubby" Callis

Paul "Pab" Boothroyd mixes at the FOH position on a Midas XL-4. He is aided by crew chief John "J.R." Robbins (who divides his time between mixing and giving sales presentations on his line of custom shower heads, available at the FOH box). "[The program] is very simple, very basic," says Boothroyd. "No effects, no samples, nothing like that. A little bit of small rooms, but that's it."

Robbins concurs. "We don't use a lot of effects; just ambient effects, a couple of delays every now and then, very minor—to give the mix a little bit of depth," he says. The FOH outboard racks include Lexicon 480L and 300L models, a few Varicurves, a TLA100A and Drawmer gates. Mics include a Beyer wireless for Johnson's vocal, with Shure SM91s, Beyer M88 and EV 409s on drums. Additionally, guitar and bass isolation boxes are miked from a room below the stage floor. There is minimal automation—flying submaster faders and VCA only. "We don't even change programs," says Robbins. (An exception to the no-frills production is an FOH pyrotechnic cue box that triggers sound effect samples from selected pyrotechnic cues.)

High SPLs on this tour pose a new mixing challenge for Boothroyd, who recently toured with Paul McCartney, and Robbins, who worked for years with John Mellencamp. "Obviously, it's a loud-level show," says Boothroyd. "You're trying to keep things controlled—spill onstage, for example—the monitoring's very loud. Things like that affect the sound, so you're working around those parameters. I just amplify them onstage.

"It's all about gain-staging," concludes Boothroyd. "What you hear is what's coming from them. It's just loud, which is the nature of the beast; and that's what makes AC/DC." ■

Sarah Jones is still wearing her earplugs.

NEWSFLASHES

Garth Brooks' upcoming world tour, which begins this spring, will carry three ATI Paragon mixing consoles. All equipment for the tour will be provided by **MD Systems** (Nashville). ATI also reports that Stevie Wonder purchased two Pro^6 audio processors at last winter's NAMM show... **Canada's House of Parliament** (Ottowa) installed 20 Drawmer DL441 Auto Quad compressor/limiters as part of the system used by members of the Canadian Parliament...The Nashville Network installed a 60-input Soundcraft SM-24 sound reinforcement console in its oldest broadcast venue, the **Gaslight Theater**. The console was initiated with use on *Prime Time Country*...Hi-Tech Audio provided sound reinforcement co. **ShowCo** (Dallas) with a Yamaha PM4000M monitor-mixing console for the recent Clint Black tour. The current All 4 One tour is using a Yamaha PM3500 FOH console and a PM3500M monitor console provided by Sound Image (San Diego, Calif.)...**Sundown Sound** (Portland, Ore.) purchased a Ramsa SX-1 console. ■

—FROM PAGE 108, LIVE SOUND WORKSHOP

mechanics of hearing loss and promote hearing-protection awareness. Lahaie explained that many professionals don't get hearing exams because they fear the results, but some kinds of hearing impairment are correctable, and early detection can prevent unnecessary damage. If you haven't had a hearing test lately, I encourage you to visit an audiologist.

Lahaie also discussed what is perhaps the simplest option for hearing protection, ear plugs. Custom-molded Etymotic Research ER-15 Musician's Earplugs™ provide 15 dB of attenuation at all frequencies and cost about $100. Foam ear plugs only cost about a buck a pair. Cabot Safety Corp. (317/692-6666) makes the little yellow disposable foam E•A•R plugs, and, through dealers, a box of 100 pairs sells for less than $25. An important strategy is the use of a simple SPL meter (RS cat. No. 33-2050 costs $32) to monitor levels and manage exposure. Even under liberal OSHA guidelines, exposure to 100 dB should be limited to two hours without protection and assumes that exposure the rest of the day will be less than 85 dB.

QUICKTIP

When setting up the gain structure in a sound system, one way to ensure maximum signal-to-noise and useful operating headroom is to ensure that each device in the signal chain will start to clip at the same point. Although many products have clip indicators, there are varying conventions about the exact level, relative to clipping, at which the clip LED lights. Typically, verifying the level at which a line-level unit clips will require a session at the bench with an oscilloscope.

However, this is not always practical, particularly in the field. Syn-Aud-Con's Pat Brown suggests a simple but accurate method for determining clip point using a Motorola piezo device. Brown uses a garden-variety round piezo with a dual-banana plug, for which he has various adapter plugs. These high-frequency transducers typically pass only frequencies above 1 kHz, so a 400Hz test tone will not be heard, but the high-frequency harmonic by-products of clipping will. Turn up the signal until the harmonics can just be heard through the piezo, then back the level down until they disappear. Measuring this output with a voltmeter will tell RMS voltage at clip. *—Mark Frink*

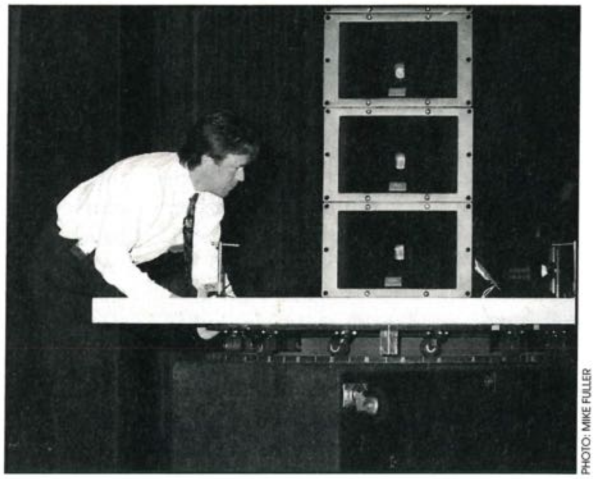


PHOTO: MIKE FULLER

Mick Whelan with JBL HF array demo

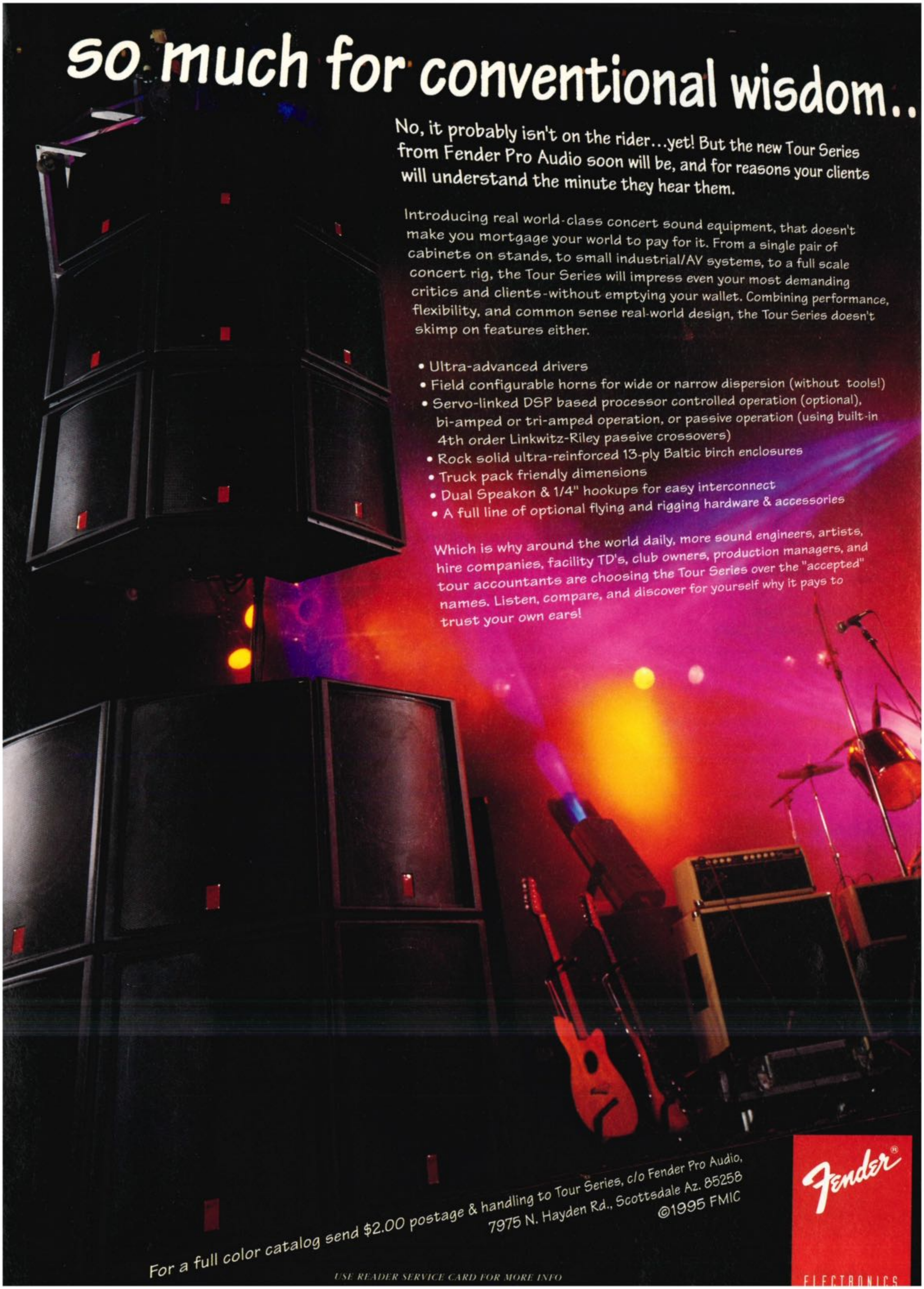
The first afternoon presentation—"When Things Go Wrong," on safe loudspeaker rigging practices—included scenes of the famous Garth Brooks rig that collapsed in Dallas. A video by ATM Flyware's Andrew Martin revealed the benefits of various types of speaker construction. Martin recommends that speakers designed to be flown overhead be tested destructively to certify their load-bearing capacity. The video shows a series of identical cabinets made with a variety of materials and construction techniques being run through destructive hydraulic pull-tests. Enclosures made of particle wood, ACX plywood, maple plywood and cross-laminated, multi-ply birch were shown, each made using butt, dado and rabbit joints. Particle wood gave way with no warning, and ACX and maple plywood crackled before breaking. Birch plywood with dado joinery withstood 8,000 pounds for more than 60 seconds, illustrating the importance of materials and construction technique. This was followed by a nuts-and-bolts discussion of commonly used rigging hardware and techniques. In the alternative-track seminar, Floyd E. Toole, Ph.D., vice president of engineering for Harman International, gave a lecture on the art of listening, speaker placement and room acoustics.

The second morning began with Mick Whelan's demonstration on the interaction of multiple transducers in arrays. Starting with a discussion of the term "arrayability," a visual representation of speaker interaction showed interference patterns, illustrating the importance of adjacent transducers being bent in an arc and the difficulty of arraying high-frequency drivers because of their shorter wavelengths. A high-frequency driver was placed on an onstage turntable to sweep across the audience and demonstrate its horizontal coverage. Adding more drivers, placed beside the first in the same plane, audibly confirmed this interaction. Piling them up vertically finally cleaned up the multiple-driver interactions in the horizontal coverage pattern.

This presentation was followed by Dave Robb's lecture on the multiple sub-system approach to theatrical sound system design, and, in the afternoon, Robb followed with a demonstration of precedence effect in distributed speaker systems. That afternoon, special guest Steve McCale offered an introduction to ear monitor applications and techniques (McCale's article on in-ear monitoring is on page 100). A series of small group roundtable discussions ended the second day, allowing intimate and animated one-on-one question-and-answer sessions with the presenters.

The third day began with a humorous discussion on mic selection. Other topics included gain structure, consoles and outboard processing. During lunch, a select group of volunteers miked up the stage. With the help of the Doug Stone band, the last half of the day was a full-blown demonstration of soundcheck procedures, ending with live music and hands-on participation of workshop attendees at all the consoles.

For those interested in participating in seminars like the Live Sound Workshop, Synergetic Audio Concepts (800/796-2831) is offering its Sound System Design Seminar from June 10-12 in Salt Lake City, in Toronto June 26-28 and in Boston July 11-13. There is also a special Advanced Design Seminar being offered in Greenville, Ind., July 22-24. ■



so much for conventional wisdom..

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NEW SOUND REINFORCEMENT PRODUCTS

WHIRLWIND MIC SPLITTER

The new Active Concert Series mic splitter systems from Whirlwind (Rochester, NY) provide two transformer-isolated, fixed-gain splits and one active variable-gain split for live sound and recording applications. High input impedance ensures extended frequency response from dynamic microphones, and reliability is enhanced by separate redundant power supplies. Splitters are supplied with rear panel XLR mic input connectors and MASS multipin output connectors. Each splitter channel features a 3-LED headroom indicator, ground lift switch for isolated outputs, and gain control for the active split.

Circle 212 on Reader Service Card

NON-REFLECTIVE BLACK GAFFER'S TAPE

New EconoMatte cloth gaffer's tape from Tesa Tape Inc. (Charlotte, NC) is available in black in 1-, 2- and 3-inch widths and features a matte, nonreflective finish. Tesa 53949 EconoMatte tape is formulated for good tearability and adhesion, yet leaves no residue when removed.

Circle 213 on Reader Service Card

GOLDLINE RACK-MOUNT SPL METER

Goldline (West Redding, CT) has a new rack-mount SPL meter designed for installed and touring applications. The SPL120RM3 features three microphone inputs and a three-way switch to allow easy SPL measurement at three locations and is supplied with one or three calibrated electret condenser measurement microphones. Prices are $375 (one mic) and $449.95 (three mics).

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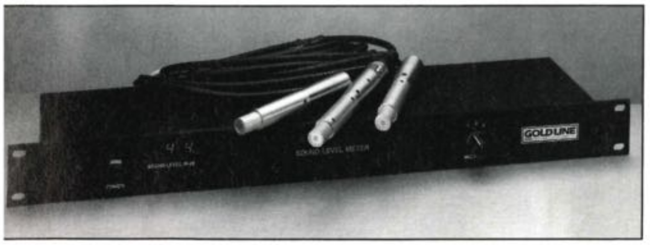

KLIPSCH UPDATES HERESY

Klipsch Professional (Hope, AK) updates its famous "Heresy" loudspeaker as the KP-250 II. The new three-way speaker features Tractrix Wave™ mid and high horns for a 90°x40° coverage pattern. Both HF and midrange drivers feature new technology, resulting in smooth and efficient performance. The KP-250 II cabinet is constructed from 19mm void-free birch ply and has dual handles and protective trim. A variety of finishes are available. Klipsch also announces enhancements to the KP C Series of loudspeakers for working musicians.

Circle 215 on Reader Service Card

YORKVILLE'S NEW TX LOUDSPEAKER SYSTEMS

Yorkville Sound Inc. (Niagara Falls, NY) has introduced a new TX Series of large-format loudspeaker systems for large venues and touring applications. The series includes the three-way TX-8 and matching TX-8S subwoofer, the bi-amped TX-4 and the bi-amped TX2M floor monitor. Main speakers are trapezoidal and feature processor control, Speakon connectors and ATM Fly-Ware™ rigging hardware. All systems are constructed from 13-ply Baltic birch and incorporate 1U rack-mountable multi-channel, self-calibrating processors with XLR inputs and outputs.

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AKG'S NEW UHF MICS

AKG Acoustics' (Northridge, CA) new WMS 300 UHF wireless microphone system features true diversity, with two antennae per receiver, and up to 16 different frequency options within the 20MHz bandwidth. According to AKG, UHF technology allows for shorter antennae and makes the WMS 300 system less vulnerable to common sources of radio interference; up to eight different WMS 300 units can be operated simultaneously. The WMS 300 system supports ten different microphone options, including three handheld microphones and six bodypack systems.

GALAXY IKON

Galaxy Audio's (Wichita, KS) IKON™ line of self-contained P.A. products are targeted at schools, churches, clubs and performers. The powered wedge monitor and conventional box configuration speakers include integrated mixing (and optional reverb) facilities. The IKON control panel (front-facing on wedges, rear-facing on the boxes) includes a 3-band equalizer, phantom power, foldback for driving external monitors, RCA inputs for line-level sources, and Neutrik combination connectors for XLR and ¼-inch inputs. Each model is also available as an unpowered speaker.

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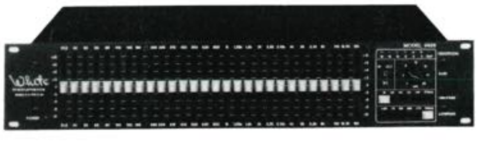

WHITE ⅓-OCTAVE GRAPHIC

The Model 4828 ⅓-octave graphic equalizer from White Instruments (Austin, TX) features 60mm sliders for enhanced boost-and-cut accuracy, EQ in/out switch, balanced XLR and ¼-inch inputs and outputs, adjustable high and lowpass filters, automatic bypass relay and power-up delay, 20 dB of variable gain makeup and an LED headroom meter. Distortion is rated at less than 0.01% and noise at -90 dBu.

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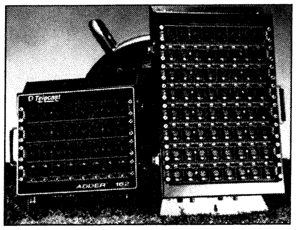

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SECOND-GENERATION TELECAST ADDERS

The new Adder™ family of portable, digital fiber-optic microphone snake splitter systems from Telecast Fiber Systems (Worcester, MA) can replace large, unwieldy analog multicore cables with a single lightweight, durable fiber-optic cable. Available in 32- and 64-channel formats, the Adder snake systems convert analog mic inputs to 20-bit digital audio and can distribute those signals, along with intercom and data/control signals, to multiple locations, such as FOH and monitor mix position and a recording truck. Features include switchable phantom power, self-contained test generator and signal monitor, battery or AC power with internal UPS and automatic redundancy for sensitive applications via alternate routing schemes.

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AQUILA WIRELESS IN-EAR MONITORING SYSTEM

Aquila Systems (San Bruno, CA) offers a new cost-effective VHF wireless in-ear monitoring system. The WAM 16 VHF TX transmitter and WAM 16 VHF RX receiver connect via 16 digitally synthesized VHF stereo channels, ensuring that users are never without multiple clear and open channels. The WAM 16 VHF TX transmitter is a 1U device featuring VU meters, ¼-inch and XLR inputs, cue input, headphone monitor output, LED channel indication and stereo/mono switched operation. The lightweight WAM 16 VHF RX is powered by a single 9V battery. The WAM 16 VHF system is supplied with "ear bud"-style ear pieces, but will support custom ear pieces. Price is $1,499.

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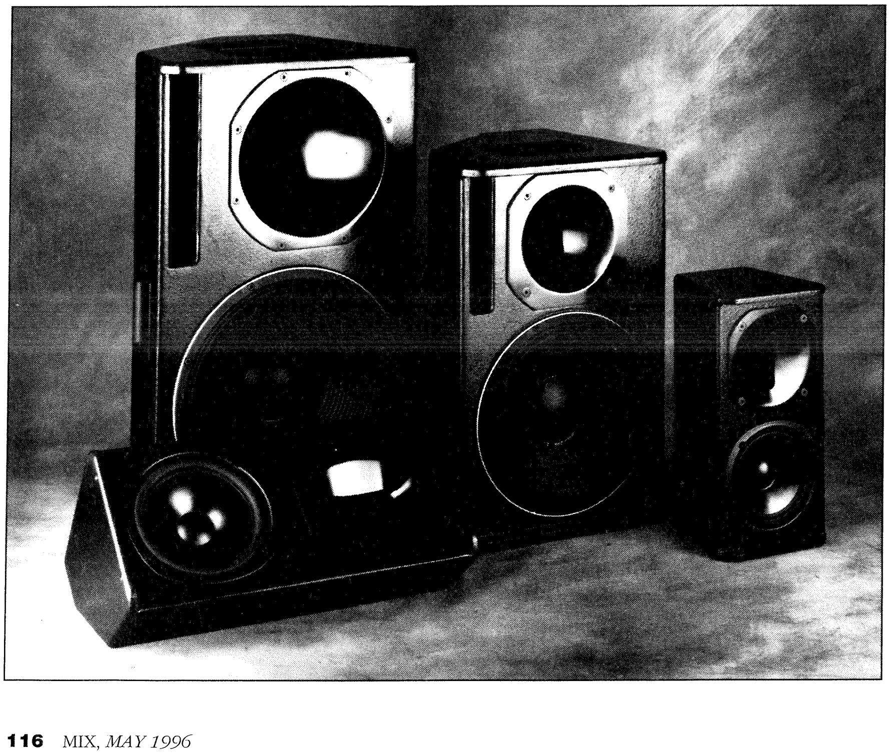

SPIRIT LIVE 4 MIXER

Spirit (Auburn, CA) announces the second-generation Live 4 mixing console for FOH and recording applications. Available in 12-, 16-, 24-, 32- and 40-channel configurations, the Live 4 MkII's input channel features include 4-band EQ with sweepable mids, highpass filter, six aux sends per channel, individual +48V phantom power, phase reverse, direct outs and a new Ultramic Plus™ preamp that will accept line level without a pad and offers 66 dB of gain. A 10x2 A/B matrix output derived from the four subgroups, four mute groups and four stereo effects returns are standard. Four additional stereo input channels are standard on the four larger consoles (the 12-input model has two). An 8-channel expander module is available for 12- and 16-channel models. Prices start at $1,999.95 for the 12-channel Live 4; the 40-channel model is $7,299.95.

Circle 221 on Reader Service Card

RENKUS-HEINZ TRC SERIES LOUDSPEAKERS

Renkus-Heinz (Irvine, CA) announces a complete line of full-range, two-way speakers for a variety of installation, live sound and floor-monitor applications. TRC61, TRC81 and TRC82 systems are compact loudspeakers based around 6.5- and 8-inch woofers, whereas the TRC121, TRC151 and TRC152 feature 12- and 15-inch woofers. All systems offer 1- or 2-inch HF drivers with Complex Conic user-rotatable waveguides for superior pattern control. Several of the models feature multi-angled cabinets, making them suitable for floor-monitor wedge applications. A wide choice of finishes is available, and the cabinets are shielded for A/V applications.

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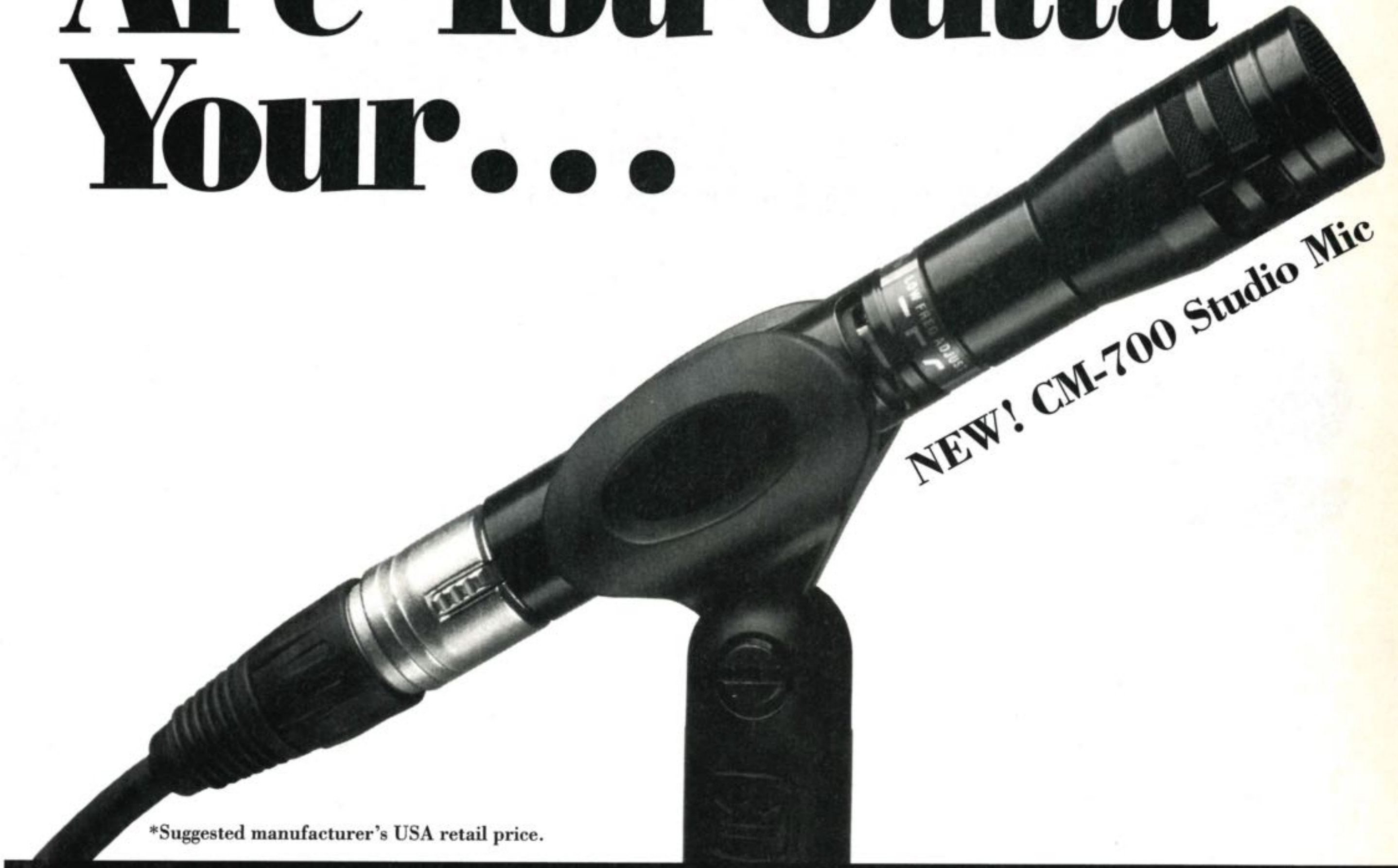

*Suggested manufacturer's USA retail price.

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> *"It's too clean. Don't change it."*
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> **– Bill Tullis, Music Engineer/Producer Turner Broadcasting**

> *"... it's frequency response is extremely smooth, even and extended .... the lower end is particularly impressive, lending a depth and fullness surprising for the job."*
>
> *"... the aspect that sets the CM-700 apart .... its sound."*
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> *"The revelation came with vocals .... placed in front of a singer, its performance was so startling that I had to go back to the console to check that I was listening to the right channel, as the richness and depth I was hearing could easily have come from one of the large-diaphragm workhorses that I was using as a comparison."*
>
> *"For once a condenser looks as though it is up to any of the rigors the road can throw at it while still giving remarkable results in the studio."*
>
> **– Dave Foister, Reviewer, Studio Sound**

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BY SARAH JONES

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A quality studio amplifier is a crucial component of a pro monitoring system, yet the importance of this choice is often overlooked. Unfortunately, many users don't seem to understand the importance of amp performance to the flexibility, character and most importantly, sonic integrity of any system.

Today's amps are more sophisticated than ever. Improved circuit design and components offer higher fidelity, and many amps are equipped with configuration options, plug-in add-on cards and data links to remote controls. Innovative and intelligent circuit-protection systems contribute to greater reliability in the latest units.

Finding the ideal amplifier isn't necessarily an easy process, so take some time to check out what's available and spend some time auditioning various models. To help you get started, here's a list of the top-of-the-line models from major manufacturers. These products, listed alphabetically, represent the latest developments in design and the newest advances in technology.

AB 9620

The 9620 stereo amp from AB Technologies (Roseville, CA) delivers 825 watts per channel into 8 ohms, 1,400 WPC into 4 ohms and 2,000 WPC into 2 ohms (2,250W bridged into 8 ohms, 3300W bridged into 4 ohms). Occupying three rackspaces, the unit is cooled by dual 2-speed thermal-activated fans and incorporates a modular circuit design. Features include VI energy limiters for short-circuit protection, thermal sensors to guard against overheating, "soft-clip" speaker protection and AB's "Logic Operated Gated Output" supply system, which controls and eliminates unused headroom. Front panel components include individual channel signal level bar graphs and controls, AC power switch and power-on LED indicator. Inputs are unbalanced ¼-inch/balanced XLR; outputs are five-way binding posts. List price is $2,410.

ALESIS MATICA 900

Alesis (Los Angeles) offers the Matica 900, a 2-channel amp rated at 900 watts per channel at 8 ohms, 450 watts per channel at 4 ohms and 1,350 watts bridged at 4 ohms. The unit is housed in a 2U chassis and features a high output stage and also handles 2-ohm operation. Circuit features include the CoolSync™ thermal management system, which increases airflow based on program material rather than heat changes. A MediaLink™ data port and eight levels of protection circuitry are also built in. Suggested retail price is $629.

ASHLY CFT-1800

The CFT-1800 From Ashly Audio (Webster, NY) is a 2-channel, convection-cooled amp, with a power rating of 200 W per channel (RMS) into 8 ohms, 300 W into 4 ohms (600 W into 8 ohms in bridged-mono mode). Modular construction features include Class A

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CHANNEL B

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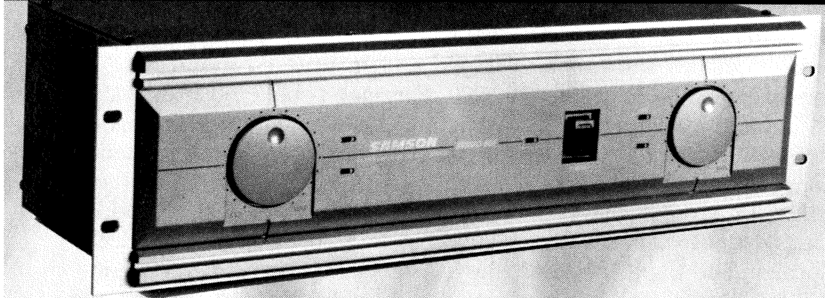
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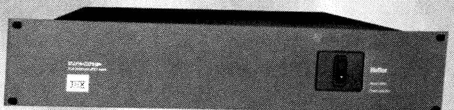
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Hafler

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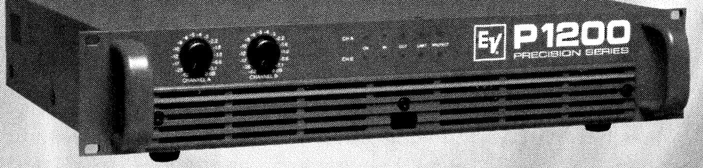
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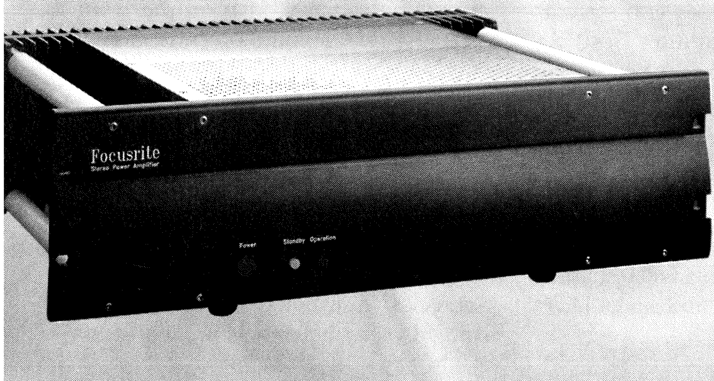
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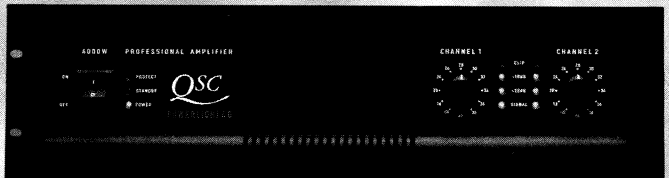
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complementary front end; MOSFET output devices; and safeguard circuitry that protects against thermal overload and shorted, open or mismatched loads. Ashly's PowerCard Input feature is optional; input transformers are also available. Three-color front panel LED meters indicate channel output levels; attenuator controls are found on the rear panel. Inputs are XLR, ¼-inch and barrier strip; outputs are five-way binding post. Retail price is $1,020.

BGW 750G

The BGW 750G has a dynamic power rating of 360 watts per channel into 8 ohms, 650 watts per channel into 4 ohms and 1,000 watts per channel into 2 ohms (in bridged mode, 1,300 W into 8 ohms, 2,000 W into 4 ohms). The 4U chassis has a fan-cooled, all-discrete, 2-channel design with active balanced inputs and high-speed BGW Ultracase™ transistors; a transformer-isolated input option is available. In addition to a dual-speed cooling system, ten pounds of aluminum is used as heat sink to assist in thermal management. Protection systems guard against short-circuit, thermal overload and DC offshoot, and provide a turn-on delay to protect speakers. Front panel features include LED level bar graphs, individual level potentiometers and AC power switch. Inputs are ¼-inch/XLR; output connections are five-way binding posts. Price is $1,849.

BRYSTON 4B ST PRO

Bryston (Monrovia, CA) offers the 4B ST PRO, a 2-channel amp delivering 250 WPC into 8 ohms, 400 WPC into 4 ohms, and 800 W bridged into 8 ohms. The convection-cooled circuitry comprises two discrete channels with separate, regulated power supplies, and includes high-current reserves and Bryston's proprietary Quad-Complimentary output section, which is designed to provide lower distortion across the audio band. Also included is a soft-start circuit to reduce current surge. Front panel features include transport handles, AC power switch and dual-colored power/clipping lights. Inputs are gold-plated balanced XLR and ¼-inch; outputs are gold-plated binding posts. List price is $2,095.

CARVER PM1400

The Carver (Lynwood, WA) PM1400 is a 1U stereo amp delivering 475 WPC into 8 ohms, 700 WPC into 4 ohms, 1400 W into 8 ohms bridged-mono and 900 W into 4 ohms parallel mono. Circuitry features include Carver's patented Magnetic Field Technology (which improves power-supply efficiency by using more of the 120VAC peak-to-peak area); Power Sequencing to remotely turn on/off individual amplifiers; and a transverse fan cooling system, which minimizes temperature differentials between transistors. An internal compression system senses clipping and engages circuitry that reduces distortion. Additional protection systems guard against thermal overload, short circuit, DC offset or internal power supply fault. Via an optional module, the amp accommodates MediaLink™ computer control. Rear panel I/Os include ¼-inch/XLR inputs and binding-post outputs. Price is $1,350.

CARVIN F1200

The F1200 from Carvin (San Diego, CA) offers 400 W per channel into 8 ohms, 600 W per channel into 4 ohms and 1200 W bridged into 8 ohms. In PowerMax™ 2-ohm mode, the amp delivers a continuous 600 W per channel. Dual variable-speed fans and cross-flow aluminum heat sinks cool the MOSFET design circuitry, which includes linear power supplies with toroidal transformers and protection circuitry (including short-circuit, no-load, thermal, mute and SpeakerGuard™ protection). Front panel features include power switch, channel attenuation controls and LED indicators (Signal Present, Clip, Protect, Power). Inputs are balanced ¼-inch/XLR; outputs are ¼-inch, Speakon and binding-post. Rear panel DIP switches allow the user to select highpass filter (-3 dB at 20 Hz), ground lift, mono bridge output and input configuration options. Retail price is $629.

CHEVIN A3000

The Chevin (Crystal City, MO) A3000 is a 2-channel amp that delivers 500 WPC into 8 ohms, 900 WPC into 4 ohms and 1,600 WPC into 2 ohms. The unit weighs 27 pounds and features short, symmetrical audio paths housed in a 2U chassis. Circuit features include a high-current, high-voltage, solid-state power supply and channel-protection systems including power-up mute, SoftClip overdrive protection, and protection against DC/HF output and short circuit. Heat sinks are crosswise-oriented, with circuit-controlled twin-fan cooling assistance. Inputs are XLR (either balanced or unbalanced), outputs are Speakon. Front panel controls include power switch and LED, output level/channel gain controls, and clip and signal LEDs. Price is $3,169.

CREST CC301

Crest Audio's (Paramus, NJ) CC301 is a 2-channel, convection-cooled amp. The modular design features a bipolar power supply and Class H output stage, and proprietary IGM™ (Instantaneous Gain Modulation) impedance sensing and Auto Ramp™ signal control. Discrete protection systems guard against short circuit, DC voltage on outputs and thermal overload. Each channel delivers 350 watts into 8 ohms, and 500 watts into 4 ohms; in bridge mode, power output is 1,000 watts into 8 ohms. The front panel has gain controls and LEDs indicating Active, Temp/DC, Signal Present and Clip/Limit for each channel. Inputs are balanced XLR/barrier strip, outputs are five-way binding post/barrier strip. The CC amplifier line is compatible with other Crest amps, Crest Octal Socket Accessories and the NexSys™ computer-controlled audio system. List price is $1,990.

CROWN REFERENCE I

Crown International Inc. (Elkhart, IN) offers the Studio Reference I, a stereo amplifier with an output power rating of 780 WPC into 8 ohms, 1,160 WPC into 4 ohms, and in bridged-mono mode, 2,220 watts into 8 ohms and 1,580 watts into 16 ohms. The Studio Reference I circuit design includes Crown's patented ODEP (Output Device Emulation Protection) system. The unit, housed in a 4U chassis, is convection-cooled with the assistance of computerized on-demand proportional fan cooling. Indicators include enable, signal, IOC and ODEP LEDs; and 5-segment dynamic range/level meters. Inputs are balanced XLR/phone; outputs are binding posts. Retail is $3,950.

DEMETER VT275HF

The VT275HF from Demeter is a stereo tube amp offering 75 watts per channel into 2, 4 or 8 ohms. Preamp tubes are two AT7As and one 12AX7A; output tubes are four SOVTEK 6550s. A fully regulated 350 volts is supplied to preamp tubes. Cooling is through an open-slotted front panel; also on the front panel are dual volume controls, power switch and LED power indicator. Circuit components include toroidal transformer power supply and bifiler output transformers. Inputs are TT, outputs are ¼-inch. Price is $1,895.

DYNAUDIO CHORD SPA 1032

The Chord SPA 1032 from Dynaudio Acoustics (distributed by AXI in Rockland, MA) is a 2-channel, 3U amp with a

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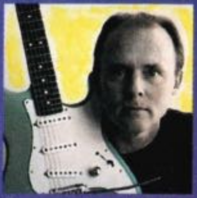
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continuous power rating of 280 watts into 8 ohms, 400 watts into 4 ohms and 500 watts into 2 ohms. The circuitry is a Class AB sliding-bias design and includes a self-contained, self-monitoring power module, a mains input filter, and an output stage developed around metal-on-silicon MOSFET devices. The cooling system comprises twin fans controlled by dual heat sink sensors (temperature-activation bypassable/configurable in custom installation). Front panel components include power, fault, signal present and clip indicators. Inputs are gold XLR; outputs are two sets of binding posts. Retail is $3,749.

ELECTRO-VOICE P1200

The Electro-Voice (Buchanan, MI) P1200 is a 2-channel, 2U amplifier in the Precision Series™ line. Housed in a 2-rackspace chassis, the P1200 delivers 370 WPC into 8 ohms, 550 WPC into 4 ohms and 650 WPC into 2 ohms (1,100 W bridged into 8 ohms, 1,300 W bridged into 4 ohms). Internal components are mounted directly to a large aluminum heat sink; three-stage fans further regulate temperature. EV's Dual Differential Discrete Topology™ circuit uses discrete electrical components instead of integrated circuits and is fully symmetrical for both polarities. Protection systems guard against thermal overload, RF interference, shorted outputs and DC faults; power-up relays avoid damaging transients. Built-in output limiters switch between fast and slow operation. Also integrated are switchable high- and lowcut filters. Inputs are XLR; outputs are XLR/Speakon connectors. List price is $1,734.

FOCUSRITE RED 5

Focusrite (distributed by Group One in Farmingdale, NY) offers the Red 5, a 2-channel, hand-assembled amp delivering (continuous) 250 WPC into 8 ohms, 300 WPC into 4 ohms and 400 WPC into 2 ohms. The fully-balanced design features dynamically coupled power supply rails, protection systems against short circuit and thermal overload, and a sliding-bias Class AB output stage with lateral-structure custom MOSFETs. Inputs are XLR, outputs are binding post. Retail price of the Red 5 is $2,750; an 8-channel version (for multi-amped systems) is available for around $10,000.

HAFLER 9505

Hafler's (Tempe, AZ) 9505 Trans•Nova differential-input stereo amp has a power rating of 250 WPC at 8 ohms, 375 WPC at 4 ohms and 750 W in 8-ohm bridged-mode. The unit is a convection-cooled, J-FET input/MOSFET output design, in a 3-rackspace chassis. Circuitry features include Hafler's Trans•Nova (TRANSconductance NOdal Voltage Amplifier) technology and DIABLO (Dynamically Invariant AB Linear Operation) front-end driver circuitry, which works on a variable-gain current-steering principle to reduce distortion/enhance headroom. Inputs are balanced ¼-inch/XLR and unbalanced RCA; outputs are five-way binding posts. The front panel includes transport handles and AC power switch. Retail price is $2,200.

HILL CHAMELEON STUDIO THREE

The Studio Three from Hill's Chameleon Series (distributed by Klay Anderson Audio, Salt Lake City) is a single-rackspace amp delivering 400 WPC into 8 ohms, 635 WPC into 4 ohms and 1,600 WPC (dynamic burst) into 2 ohms. Bridged-mono operation is rated at 1,270 W (average) into 8 ohms, and 3,200 W (dynamic burst) into 4 ohms. V-shaped aluminum heat sinks forming chassis sides offer heat dissipation; the fan-cooling functions at high operating temperatures. Thermal and short-circuit protection circuits are standard. Other features include low-noise power supply, calibrated input attenuators and

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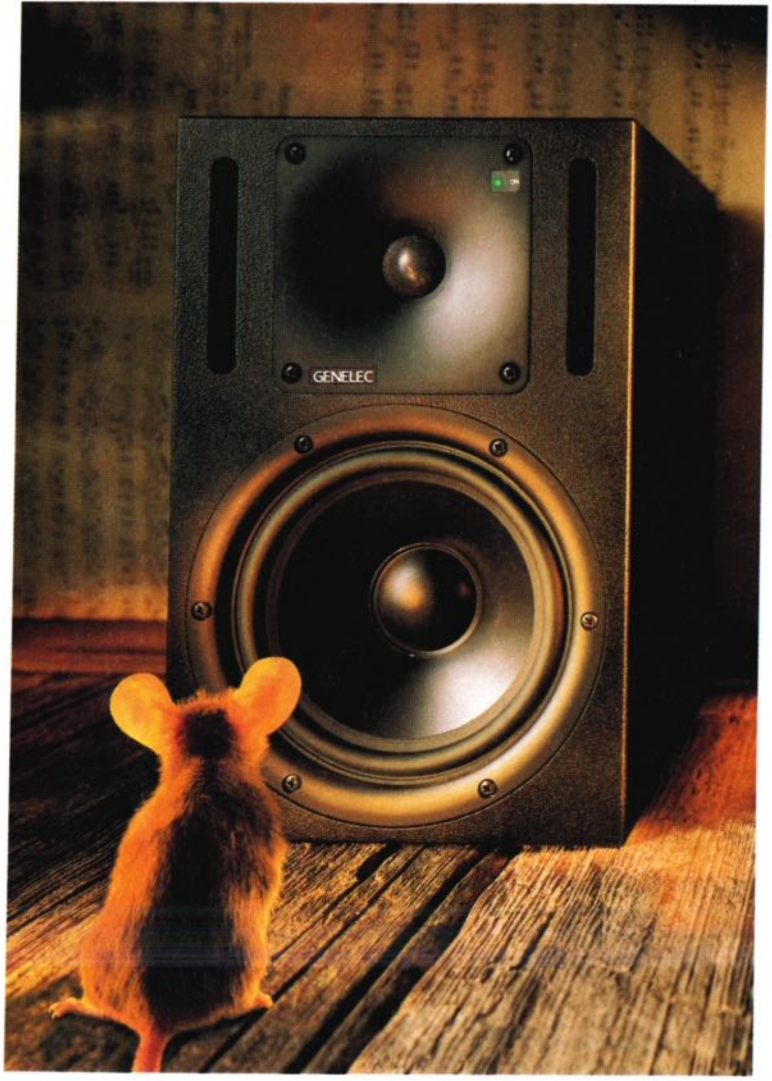

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soft-start circuit. Front panel LEDs indicate signal present and peak, power and bridge mode. Inputs are XLR/¼-inch and outputs are binding posts. Suggested retail is $1,990.

HOT HOUSE 600

Just released is the 600, the first in a new series of power amps from Hot House of Highland, NY. The 600 is a 2-channel amp with a power rating of 175 WPC into 8 ohms, 275 WPC into 4 ohms and 325 WPC into 2 ohms (in bridged mode, 550 W into 8 ohms and 650 W into 4 ohms.) The amp is a true dual-mono design, with all-discrete components. Circuitry features include hand-matched lateral power MOSFETs, toroidal transformers and Teflon Kimber Kable throughout. The unit is convection-cooled and is housed in a 3U chassis. A dual-gain "pro/semi-pro" selection switch replaces level controls. Inputs are combo XLR/¼-inch balanced, with an auto-unbalance function built in. Outputs are five-way binding post. Retail is $2,195.

JBL MPA1100

The JBL (Northridge, CA) MPA1100 has a power rating of 1,200 W per channel into 4 ohms, and 820 W per channel into 8 ohms (2,400 W into 8 ohms, bridged). The MPA1100 features JBL's Open Architecture™ construction, allowing custom configurations via optional cards including a 2-channel, two-way crossover card; an 18dB/octave sub-bass crossover card; a cinema crossover module; and input connector expansion. An internal output power limiter protects the amp and loudspeaker from excessive power. The 3U unit is fan-cooled, and protection circuitry offers short-circuit, open-circuit, ultrasonic and RF protection. Inputs are barrier strip and XLR; outputs are five-way binding posts and Speakon connectors. Price of the MPA1100 is $2,595.

MANLEY STUDIO 440 TUBE AMP

Manley (Chino, CA) offers the Studio 440, an all-tube mono block amplifier, switchable between a half-power (275W) triode mode and a full-power (500W) pentode mode. Housed in a 5U chassis, the 440 circuitry features ten 6550A output tubes and a 12AT7WA input tube; the unit may be kept in an EVER-WARM standby mode. Front panel controls adjust bias measurement, feedback and slope; switches select triode/pentode and operate/standby modes. List is $9,000.

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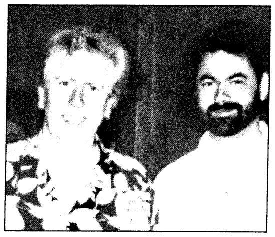
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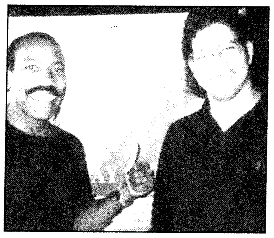
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MESA BARON

The Baron is the first audiophile product from Mesa Engineering (Petaluma, CA). The all-tube, hand-built, dual-mono amp is designed with separate power transformers and AC cords and is housed in a 5U chassis. Channel output power is switchable, via the Tandem State Imaging™ tunable soundstaging, between 150 watts all-pentode, 100 watts triode/pentode and 50 watts triode/triode (two triode/pentode switches per channel allow even more options). Internal components include self-balancing, dual-differential drive circuitry, three pairs of 5881 tubes, and four-way selectable feedback circuit. The front panel consists of dual analog VU meters, and includes switches for bias and balance adjustment, meter selection (switchable between power and adjust) and standby mode. Retail price is $3,395.

PACIFIC INNOVATIVE KHS-450

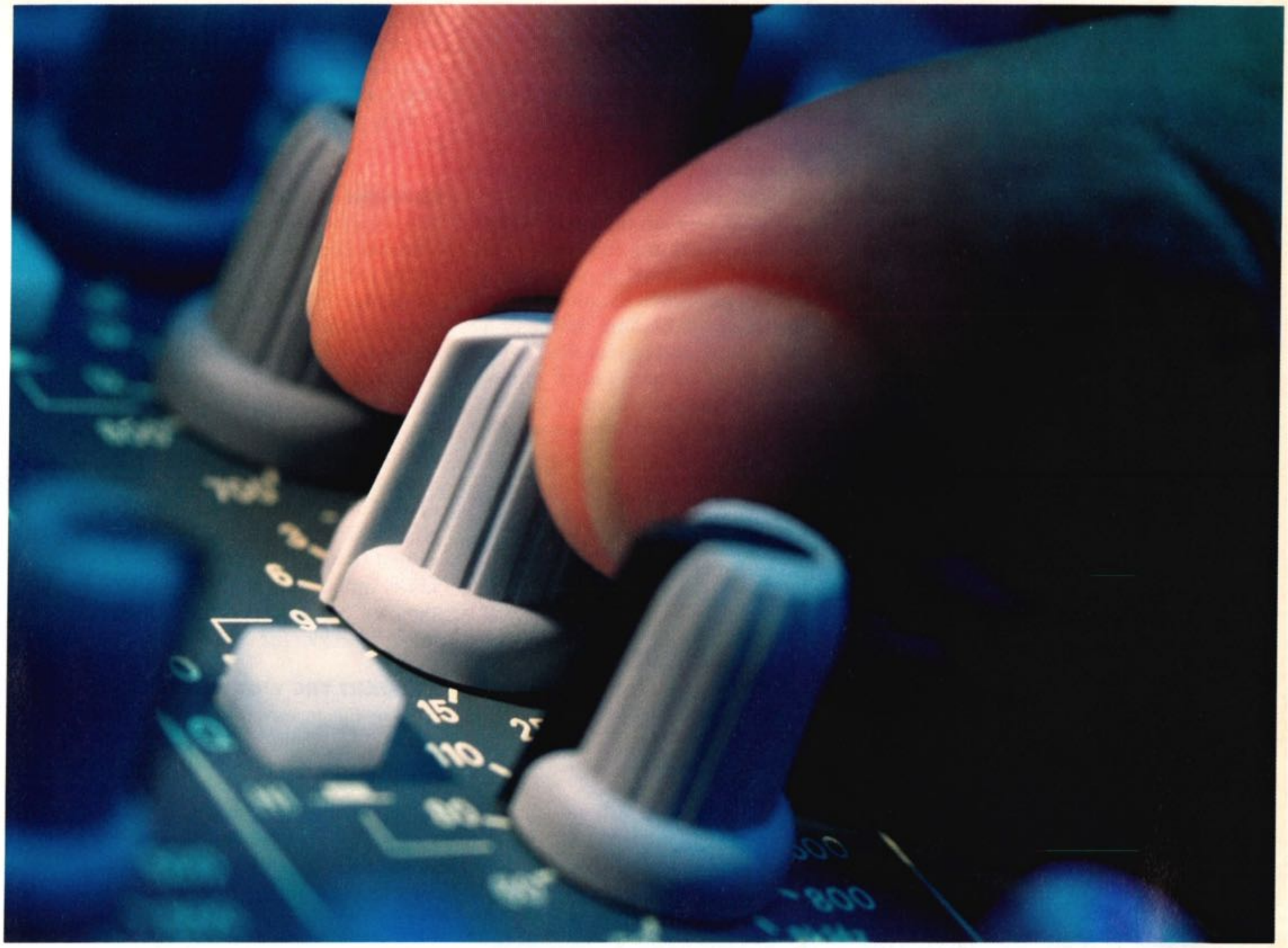
The KHS-450 from Pacific Innovative Electronics is a hand-built stereo amp that delivers 175 watts per channel into 8 ohms, and 225 watts per channel into 4 ohms. The convection-cooled MOSFET circuitry is housed in a 3-rackspace chassis and weighs 36 pounds. Inputs are balanced XLR/¼-inch; outputs are binding-post/Speakon connections. List price is $2,535. Also available is the Studio Integrator, a recording/monitor bus interface. The interface offers bidirectional level shift and balanced-to-unbalanced translation; I/Os are seven stereo inputs by six stereo outputs. List is $600.

PANASONIC WP-1400

The Panasonic (Cypress, CA) WP-1400 is a dual-channel amp, offering 240 WPC into 8 ohms, 400 WPC into 4 ohms and a bridged output of 800 watts into 8 ohms. Circuitry components include a fan-cooled Class H dual-voltage system that switches to a low-level power supply at lower signal levels, to help the amp run cooler and more efficiently; and a servo control system that monitors heat sink temperature and automatically varies fan speeds. The unit is housed in a 3U chassis; front panel controls include AC power switch, input sensitivity potentiometer, stereo/bridged-mono selector and LEDs indicating power, peak and protection. Input connections are XLR/TRS; outputs are five-way binding post. Retail is $800.

PEAVEY RP 500

New from Peavey (Meridian, MS) is the RP 500 studio amplifier. The convec-



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tion-cooled unit features discrete components, with matched JFETs at input and 12 high-current MOSFETs at output, in a 3-rackspace chassis; protection systems include thermal shutdown at 100°, DC offset sensing, current/voltage limiting and speaker DC protection. Signal-to noise is better than 104 dB. Rated output power is 250 W RMS per channel at 8 ohms. Front panel features include Power, Active and Clip channel LEDs and power switch; channel level controls are rear-panel. Inputs are RCA (gold-plated), XLR and phone jacks; outputs are five-way gold-plated binding posts. List is $999.

QSC POWERLIGHT 4.0

The PowerLight 4.0 is the most powerful amp from QSC Audio (Costa Mesa, CA). Featuring QSC's power supply-regulating Powerwave Switching Technology™, the amp delivers 1,000 WPC into 8 ohms, 1,400 WPC into 4 ohms and 2,000 WPC into 2 ohms (1 kHz, 1% THD). Bridged-mono operation is also possible. Housed in a fan-cooled, 3U chassis and weighing 30 pounds, the unit offers protective circuitry against thermal overload, DC fault, RF/ultrasonic, short circuit and mismatched loads. Synchronized channel on/off muting operates at turn-on and at loss of AC power. Remote control is possible; a rear panel 15-pin data port connector interfaces with a QSC multisignal processor. Inputs are Neutrik Combo XLR/¼-inch and barrier strip; outputs are "touch-proof" binding posts. Cost is $2,995.

SAMSON SERVO 500

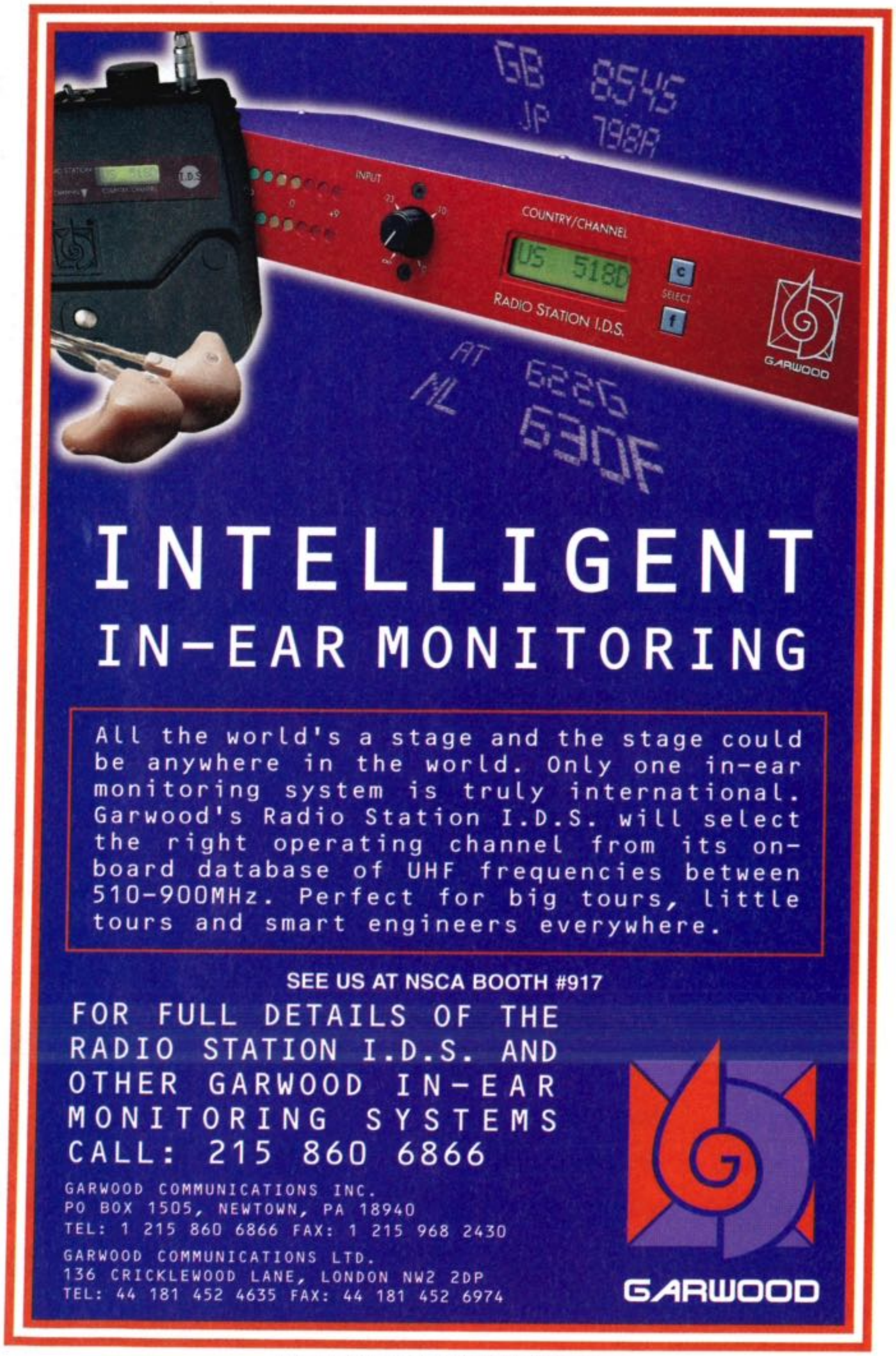
The Servo 500 stereo power amp from Samson (Syosset, NY) delivers 250 watts per channel into 4 ohms, 175 watts into 8 ohms, and in bridged-mono mode, 500 watts into 8 ohms. The unit has a bipolar circuit design, with high-current Toshiba output devices. Servo circuitry controls DC offset; and protection circuitry guards against overheating, overcurrent or short circuits. The unit is convection-cooled and is housed in a 3-rackspace chassis. The front panel has independent L/R input controls and status LEDs. Inputs are balanced ¼-inch; outputs are ¼-inch and binding post. Retail is $469.99.

STEWART THE WORLD 2.1

Stewart Electronics (Folsom, CA) introduces The World™ 2.1, the latest addition to its product line. Occupying two rackspaces and weighing 17 pounds, The World is a dual-monaural amp delivering (at 1 kHz) 450 watts per channel into 8 ohms, 775 WPC into 4 ohms, 1,050 WPC into 2 ohms and 2,100 watts bridged. The circuitry is fan-cooled, and features an intelligent short-circuit protection system and a power supply that recharges 120,000 times per second. Inputs are XLR barrier strip and ¼-inch TRS balanced/unbalanced; outputs are binding post and ¼-inch phone jacks. The front panel provides LED status indicators and individual level controls. Retail is $1,399.

YORKVILLE SR-300

The Yorkville (Niagara Falls, NY) SR-300 is a 2-channel convection-cooled power amp with a continuous power rating of 75 W at 8 ohms and 150 WPC into 4 ohms. Circuit systems include a built-in peak and average limiter, thermal overload protection and switchable highpass filter. The unit is housed in a single-rackspace chassis, with side-mounted heat sinks to dissipate heat away from other heat sinks in the rack. The front panel features individual level controls; channel Activity, Clip and Limit LED indicators; and AC power switch. Inputs are ¼-inch TRS connections; outputs are push terminal/¼-inch. The SR-300 is $489. ■



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TECHNOLOGY SPOTLIGHT

SONY DIRECT STREAM DIGITAL

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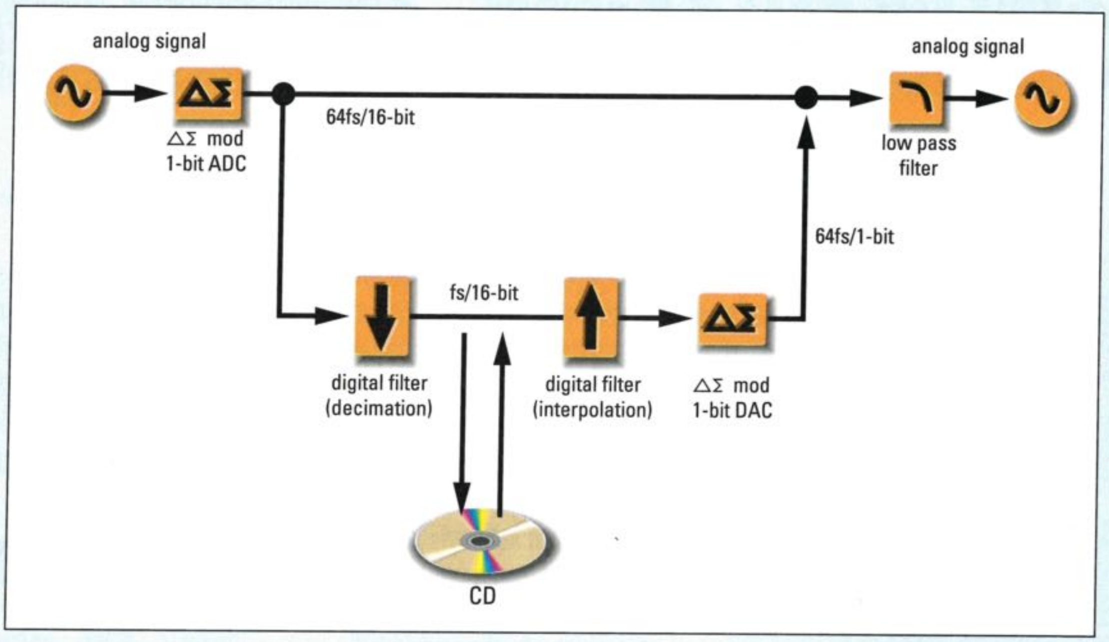

Signal flow chart for the DSD process.

BY PAUL D. LEHRMAN

"We have 300,000 master tapes, and tens of thousands of lacquers," the spokesman for Sony was saying, "and they're not getting any younger." Finding the ultimate way to archive these priceless recordings is one of the goals of a new technology Sony is proposing. Direct Stream Digital (DSD), according to the company, is a digital audio encoding system that "transfers all of the information on the original master."

Sony presented DSD to the press at a series of very small demonstration sessions in late February, at their recording studio complex on Manhattan's West 54th Street. No more than four audio journalists—mostly "golden ears" types—were in the room at a time, as David Kawakami (Sony New Technology's director for new business development) and a team of engineers from New York and Japan explained the new system; with the help of a world-class live jazz combo and a brand-new analog master tape, they put it through its paces.

Some of what comprises Direct Stream Digital is familiar: The analog signal is digitized using 1-bit delta sigma conversion. What's different is what happens next, or more accurately, what doesn't happen: The system keeps the data in 1-bit form and records it that way, encoded as a Pulse Density Modulated waveform. To play it back, the 1-bit signal is simply passed through an analog lowpass filter. It may sound like a straightforward concept, but one engineer allowed that Sony has a large number of patents on it.

DSD's sampling rate is, not surprisingly, very fast: 2.8224 megabits per channel, which happens to be 64-times the standard digital audio sampling rate of 44.1 kbytes. A little arithmetic shows the resulting information density to be four-times that of conventional 16-bit digital recording. The primary advantage of using a 1-bit data stream, says Sony, is that the errors caused by converting the stream into the usual 16-bit (or more) words—which can be caused by quantization, requantization, decimation, interpolation, jitter and a slower sampling rate—are eliminated. If you don't like the 64-times sample rate, two other rates are available by merely changing the master clock frequency: a "more efficient" 32-times rate, or a higher-density 128-times rate.

Sony claims DSD can have frequency response up to 100 kHz, and a dynamic range (within a 20kHz bandwidth) of 120 dB. A number of noise-shaping algorithms will be available to the engineer, which will allow optimization of either bandwidth or dynamic range. "Producers and engineers can allocate their own 'bit budgets,'" says Kawakami.

Another important advantage of DSD, Sony says, is that the signal can be delivered in any of the more common digital formats without deterioration. A recording can be easily

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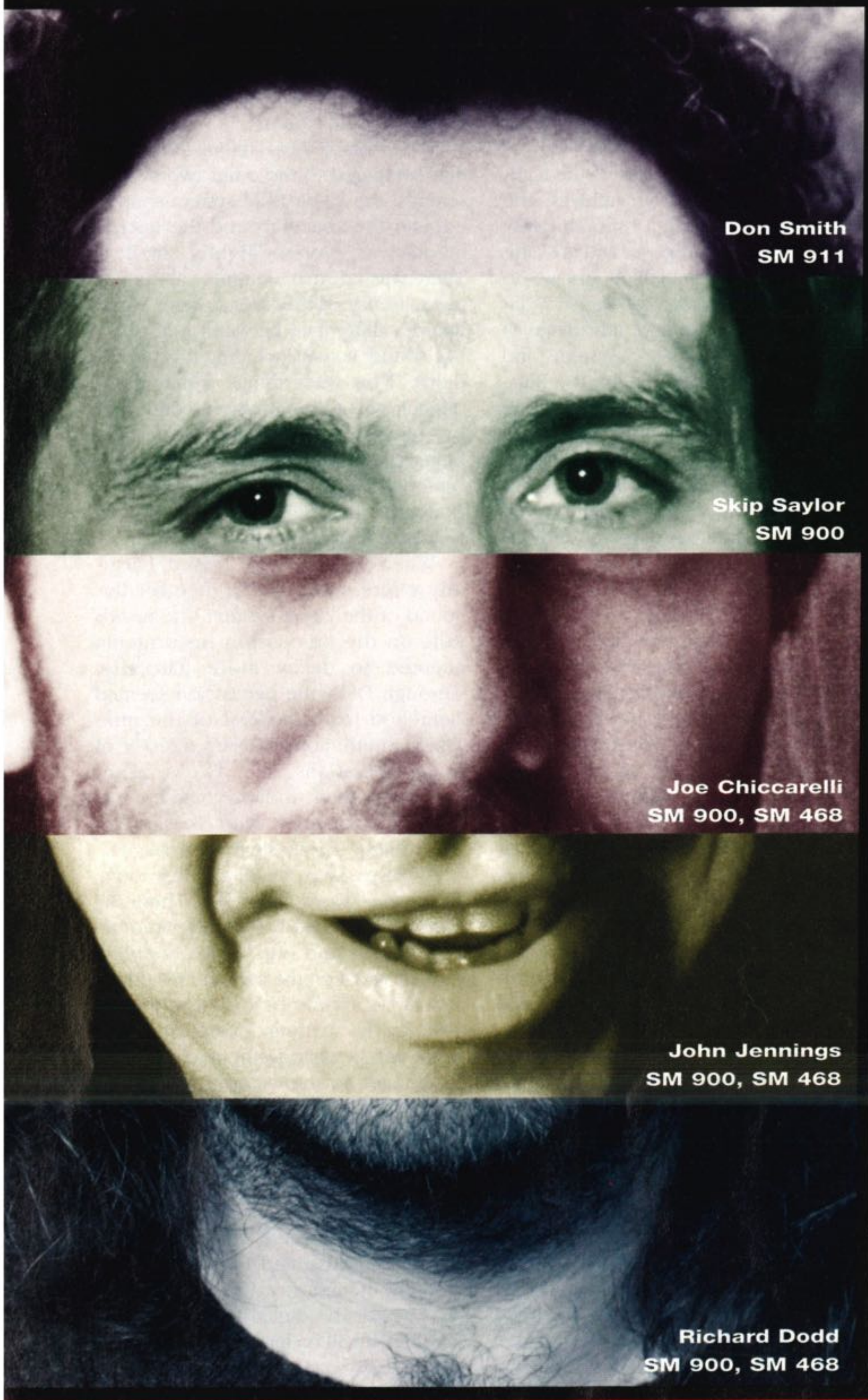
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"I've tried everything else. Once."-John Jennings

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down-converted, using relatively simple divisors, to accommodate sample rates from 32 to 96 kHz and word lengths up to 24 bits. There is significant benefit, they note, in not having to sample-rate convert or reformat the data in order to go from one medium to another. Since the DSD format is not locked into any particular delivery system, it will allow the company, as Kawakami put it, "to build an infrastructure for future distribution options"—meaning, presumably, that the system will be usable in that not-so-far-off day when recorded music is distributed by wire and fiber.

One of Sony's first uses of the technology will be for its own archives. The company is building a "silo" in New York City for this purpose, and is evaluating the conversion of all its archives to DSD on a data version of Digital Betacam tapes. "We can take advantage of the advanced automation systems and robotics that already exist [for the Betacam format]," Kawakami says. Another use is in-house mastering. Right now, the mastering format of choice at Sony Music is half-inch analog tape at 30 ips with Dolby SR, and the hope is that DSD will provide equal quality and will eliminate the need to use separate formats for mastering and archiving.

Sony is also hoping that DSD will become an industry standard for digital audio production. "We have presented it to some other manufacturers of professional audio gear," says Kawakami, "and the response has been very favorable." Are the others, he was asked, willing to go along with a technology they're going to have to pay Sony for? After all, AES/EBU doesn't cost anything in license fees. At this time, Sony has not established any licensing policies, or even whether such a move would be necessary at all. But for now, the reply was that Sony "sees this as a way to develop and sell a whole new generation of hardware."

So how does it sound? A very careful demo environment was set up for the visiting journalists to evaluate DSD. In the studio was a quartet of Andy LaVerne, piano; George Mraz, bass; Al Foster, drums; and Randy Brecker, trumpet. The guests sat in the control room, where an audiophile's dream system—Cello amp, Wilson WATT speakers—was set up with a three-way switch to select between the live feed (mixed through a Massenburg console), a signal passed through the DSD system, and a signal passed through a 20-bit stage consisting of a dB Technologies AD-122 and DCS-950 AD/DA combination stored on a Sony PCM-9000. A white screen blocked the view of the musicians, and, in fact, the listeners weren't told who was playing until the session was all over.

One at a time, we were invited to sit in the sweet spot between the speakers and switch systems, listening for any differences. After the band ran through a few standards for 15 minutes (and they sounded great), a new source was put up: a 30 ips, half-inch, Dolby SR master of an alternate mix from Mariah Carey's newest album.

The assembled ears (all male) agreed that compared to the other two switch settings, the 20-bit PCM system sounded as if the space around the instruments was ever-so-slightly smaller. There was no such unanimity about the transparency of the DSD system: Some heard a difference between it and the live sound, some (including this writer) didn't. What made things slightly more difficult was the realization, confirmed by Sony's people, that the trumpet was being processed with a digital reverb: Although it sounded nice, there was no doubt that this compromised the "purity" of the source signal.

When the Carey tape played, I actually expressed a preference for the sound of the 20-bit system: The reverb tails on the percussion instruments seemed to decay more naturally. Through DSD, the percussion seemed detached from the rest of the mix. David Smith, Sony Music's director of audio operations, said, "We've heard that from others. In fact, you'd be very flattered if you knew who else said that same thing." He declined to elaborate.

What we were hearing in that room, of course, was a prototype: Three big black boxes filled with hand-wired circuit boards and impressive coupling capacitors sat on the console. No doubt, it will be awhile before Sony brings DSD to the manufacturing level, and there will be changes by that time. The engineers, to their credit, listened as much as they talked: They were genuinely interested in how their guests responded to the system and took careful note of all comments, positive and negative. The concept of Direct Stream Digital, all agreed, makes a good amount of sense, and it could be a great boon to the industry if one of its effects was to put the digital format wars behind us. It will be interesting to see how the industry responds when Sony puts it into practice. ■

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PREVIEW

HHB MEDIA UPDATE

Having sold its millionth tape, HHB (U.S. offices in Portland, ME) announces improvements in its DAT line. Record times have been increased to 15/35/50/65/95 and 125 minutes, at no extra charge. The new formulation has decreased block rates and a stated archival life of 30 years, along with a warp-resistant shell (tested to 220°F), anti-static lid, shatterproof tape box and new J-card for studio users. HHB also unveiled professional MiniDiscs and rewriteable 5.25-inch MO disks in 1.3 and 2.6GB formats.

Circle 226 on Reader Service Card

MODULAR PATCHBAY SYSTEM

David Carroll Electronics (Richmond, CA) and Audio Accessories (Marlow, NH) have jointly developed Project Patch™, a mini (bantam TT) patchbay system targeted at project studios. The modular system is based around Audio Accessories' Mini patchbays, which are wired at the jacks to 8-channel connectors; a comprehensive selection of mating cables connect the jacks to virtually any audio equipment. Standard multipin connector cables are available for most popular modular digital multitracks, including ADAT, DA-88 and RD-8 formats.

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BSS PREAMP/EQ

BSS Audio (Northridge, CA) introduces the FCS-916 microphone preamp/parametric equalizer. Offering separate mic and line inputs, switchable 4-band parametric EQ with independent sweepable high- and low-pass filters, and phantom power, the FCS-916 is designed to replace individual mixer channels in demanding audio applications.

Circle 228 on Reader Service Card

NEW PANASONIC DAT RECORDER

The new SV-3800 DAT recorder from Panasonic (Cypress, CA) features the same type of sigma delta 1-bit, 64-times oversampling A/D converter found in the company's industry-standard SV-3700 but also includes new 20-bit DACs. The new ladder-type DACs are reportedly resistant to clock jitter, and dual DACs are used to process left and right channel data separately. The SV-3800 features 44.1/48kHz sampling rates, +4dBu and -10dBu output levels (the +4 output may be trimmed down to -6 dBu in 1dB steps) and digital I/O via AES/EBU or IEC 958 (coaxial and optical) connections. The unit also boasts a dual-speed shuttle wheel for cue location and enhanced operating features, including Skip-ID and Single Program Play functions. An infrared wireless remote is standard; enhanced remote control options are available.

Circle 229 on Reader Service Card

NEW FRONTIER ANALYZER

New Frontier Electronics (New Hope, PA) releases its DSP 2010-EX Precision Audio Analyzer, a self-contained analyzer offering real-time spectrum analysis, SPL and RT60 measurement facilities, FFT mode and 16-channel MIDI diagnostic functions, all in a single rackspace. The 2-channel unit includes a full-function audio signal generator, is fully loaded with necessary software and provides comprehensive I/O connections. List price is $2,995.

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TACTILE TECHNOLOGY M4000 MKIII UPDATE

Tactile Technology (Cerritos, CA) is now shipping new software and hardware for the M4000 MkIII automated console. New features include a merge function that allows fader moves to be copied and pasted and an undo function to recover previous settings and actions. The existing stereo link function has been expanded to include levels, mutes, solos, EQ and mirror pan. The console's LCD section now offers a channel status readout that indicates fader level, pan position, EQ settings and tape return assignments. LCD information may also be displayed on external monitors. Hardware updates include a new meter bridge and LED bar graphs on all inputs and outputs.

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SOUNDELUX TUBE MICROPHONE

Group One Ltd. (Farmingdale, NY) has signed an exclusive distribution agreement with Soundelux for the new U95 vacuum tube microphone. Featuring a 1-inch diameter capsule, the U95 offers omnidirectional, cardioid and figure-eight polar patterns with six intermediate settings. To ensure trouble- and noise-free operation, there are no switches on the microphone body; pattern selection is made at the power supply, which is switchable between 115 and 220 volts. The U95 offers a frequency response of 20-20k Hz, will accept a maximum input SPL of 135 dB (0.5 percent THD) and has a dynamic range greater than 117 dB. List price, which includes power supply, shock-mount and wooden case, is $2,900.

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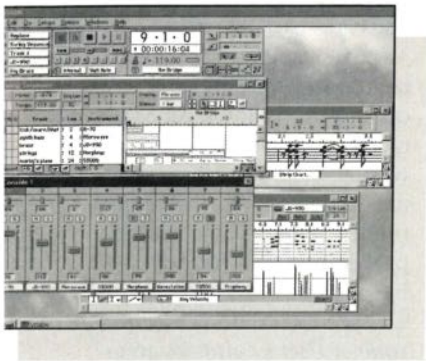
PREVIEW



OPCODE COMPLETE MIDI WINDOWS SOLUTION

Opcode, of Menlo Park, CA, announces its complete MIDI system solution for Windows. The integrated system includes Vision 2.5 MIDI sequencing software, Galaxy the Universal Librarian, Music Quest interface hardware, and the industry-standard OMS (Open Music System) cross-platform utility. In other news, Opcode has announced its MIDI Translator PC, a 2-in/2-out, 32-channel MIDI interface for PC compatibles.

Circle 233 on Reader Service Card

INTERNAL DRUM MIKING SYSTEM

Drum Workshop (Oxnard, CA) now offers the May Internal Drum Miking System as a factory-installed option on all of its snares, toms and bass drums. Developed by drummer/drum engineer Randy May, the May system combines the advantages of internal mic placement and total adjustment flexibility through 360°. Available microphone elements include models from Shure, Sennheiser, EV, Audio-Technica and AKG.

Circle 234 on Reader Service Card

SOUNDTRACS VIRTUA

New from Soundtracs (Epsom, Surrey, UK) is Virtua, an all-digital, 48-channel mixer with 4-band parametric EQ, dynamics on all channels, eight aux sends, eight subgroups, 16 direct outs, LCRS panning, moving fader automation, snapshot recall of all functions and ADAT, AES/EBU and S/PDIF digital I/O. An external rack of 32 mic/line inputs connect to the mixer via a fiber-optic link; 16 additional inputs can be used as effects inputs or monitor returns, and Virtua provides up to 64 inputs on remix. Retail is expected in the $35,000 to $40,000 range.

Circle 235 on Reader Service Card

PRESONUS ACP-8

PreSonus Audio Electronics (Baton Rouge, LA) offers its ACP-8 8-channel compressor/gate, a 2U unit with eight independent compressor/gates. Each compressor/gate section features threshold, ratio (1:1 to 20:1), attack, release and gain makeup controls for the compressor; and threshold, release and attenuation controls for the gate. Jack inputs for sidechain and key inputs are provided, and front panel controls include compression characteristic (hard/soft-knee, peak/auto) and bypass selection buttons. List is $799.

Circle 236 on Reader Service Card

SPEAKER DESIGN TOOLBOX FOR WINDOWS 95

True Image Audio (Escondido, CA) announces the release of WinSpeakerz 95, The Speaker Design Toolbox for Windows 95. Functional on any PC running Windows 95, WinSpeakerz 95 enables loudspeaker designers to calculate precise audio performance parameters of any driver in any enclosure type. As well as enclosure analysis, WinSpeakerz 95 can assist in the design of passive crossovers, impedance compensation networks and attenuators, and a driver database that includes provision for recording over 90 parameters per driver. Designers may save up to ten system designs in each project file, and saved designs may be recalled for comparison of different drivers in similar enclosures or the same driver in various enclosures.

Circle 237 on Reader Service Card

TAPELESS RECORDER

The SAM 8M Sound And Motion controller from Simon-Kaloi Engineering (Agoura Hills, CA) is a rack-mountable, tapeless, digital recorder designed for recording and playing back a variety of digital control and audio signals. SAM may be used to trigger motion and audio playback for robots and animated characters, for example, and may also control and provide input for audio annunciators and public address systems. SAM will store up to 16 different messages and can be configured for 34 minutes of recording into nonvolatile, solid-state memory. Sampling rate is selectable up to 32 kHz, and SAM accepts up to 11 trigger sources. Audio and control information may be loaded or exported via memory card and the RS-232 serial port. The unit includes line and mic inputs and a 10-watt amplifier.

Circle 238 on Reader Service Card

PreSonus
Audio Electronics
ACP-8
EIGHT CHANNEL ANALOG CONTROLLED DYNAMICS PROCESSOR

PREVIEW

AGUILAR BASS PREAMP

According to the manufacturer, the DB 680 Tube Bass Preamp from Aguilar Amplification (New York, NY) combines the warmth of "a Telefunken tube mic pre, the fidelity of a Neve 1073 module and the flexibility of a Massenburg parametric EQ." The DB 680 features two channels of parametric EQ, high/low shelving filters and "deep" and "bright" switches. The 2-rackspace unit has three outputs for live and studio applications, including a 5-position switched balanced XLR out (pre/post EQ at -20 or +4); HF and LF ¼-inch outs for bi-amping; and unbalanced mono output. List is $1,795.

Circle 239 on Reader Service Card

HOT OFF THE SHELF

Goldline's new Windows software for the company's DSP analyzers will run under standard Windows and Windows 95 and allows the DSP user to make measurements in .25dB increments. Interfaces with optional programs provide RT60, loudspeaker delay timing, noise criteria curve, THD analysis and impedance measurement functions. Call 203/938-2588 or fax 203/938-8740...Jiri Donovsky offers an **8-channel AES output digital transfer interface** for Akai DR8 and DR16 disk-based recorders. Call 213/960-9472 or fax 213/461-7391...**Jameco Electronics' new catalog** features 185 new products, including ICs, BNC connectors, stranded hookup wire, wall transformers and more. Call 800/831-4242 or e-mail to info@jameco.com...**Promusic** announces 39 new additions to its catalog of production music and sound effects, including a 43-track C&W disc from former Quiver guitarist Tim Renwick, last seen playing live with Pink Floyd and Procol Harum. Call 407/995-0331 or fax 407/995-8434...The CKD 10 and CKD 11 **near-field monitor stands from QMI** are made of steel, feature rigid construction and can be filled with sand or shot to enhance stability. The CKD 10 stands ($229/pair) are 1 meter (39 inches) tall and the CKD 11 ($249) tops out at 1.1 meters (43 inches). Call 508/429-6881, fax 508/429-7135...**Gizmo Bags from Music Industries Corp.** are designed to protect valuable electronic devices from wear and tear. Eleven models are available for carrying and storing mixers, effects pedals, tape machines, microphones, etc., at prices ranging from $20.95 to $45.95. A velour lining keeps gizmos scratch-free; construction features heavy-duty, water-resistant Cordura shell, dual heavy-duty zippers, an external accessory pouch and 50lb-rated dual handle straps and adjustable shoulder strap. Call 516/352-4110 or fax 516/352-0754...**Waves has an alliance with Macromedia** and announces that the Waves Plug-Ins V2.0 and newly announced Xtras™ products will support Macromedia's SoundEdit 16 and Deck II™ toolset for audio production and post-production. Call 423/588-9307, fax 423/588-9472 or visit the Waves Web site at http://www.waves.com/waves...ITT Pomona offers complete **Test Companion™ accessory kits** specifically designed for Fluke, Hewlett-Packard and Tektronix digital and graphical multimeters and oscilloscopes. Supplied with lightweight Cordura carrying cases, each Test Companion kit includes a selection of IEC-1010-compliant accessories tailored to provide maximum test versatility and performance. Call 800/241-2060 or fax 909/629-3317...Analog Devices announces a **new 16/18-bit stereo digital audio playback subsystem on a single chip**. The AD1859 comprises a variable-rate digital interpolation filter, a multibit sigma delta modulator with dither, a jitter-tolerant DAC and analog output drive circuitry in a 28-lead surface-mount package. Priced at $4.90 in 1,000s, the AD1859 is targeted at manufacturers of digital cable TV and set-top decoder boxes, video laserdisc players, DAWs and multimedia computers, and all forms of CD and digital tape players. Call 617/937-1428 or fax 617/821-4273...Zero International, manufacturer of door seals and gaskets, offers a 32-page catalog of **specialized sealing systems for doors and windows**. An STC rating of 53 can be achieved with Zero's Sound Trap system in combination with approved door and installation procedures. Call 800/635-5335 or fax 718/292-2243...The second edition of ***Timecode: A User's Guide*** by John Ratcliff is available now from Focal Press. Priced at $47.95, the new edition of this indispensable reference work contains new sections on using timecode with video assist and nonlinear production. Call 800/366-2665...The **1996 Measurement Products Catalog from Tektronix** is a 600-page softcover tome listing 900 products, including solutions from allied companies Advanset, Japan and Rohde and Schwarz, Germany. Nearly 100 new products are described, and detailed product descriptions are available through an on-demand fax service. Call 800/426-2200 (press 3 at the prompt and ask for program 499) or order the catalog direct via the Internet by browsing http://www.tek.com/mbd/w499...The third edition of the ***Directory of Independent Music Distributors*** from Disc Makers, the largest independent manufacturer of CDs and cassettes in the U.S., lists over 400 local and national distributors. An essential tool for anyone seeking to get an independent release into national record stores, the guide is offered free to *Mix* readers until June 30. Call 800/468-9353. From outside the U.S., call 609/663-9030. ■

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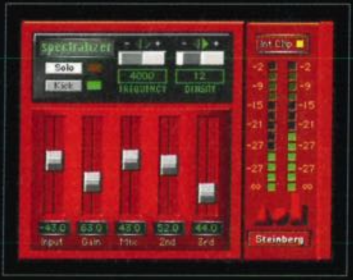
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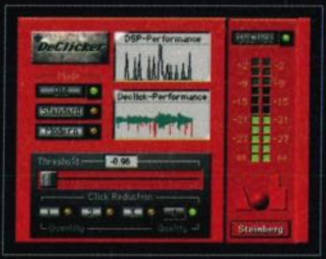
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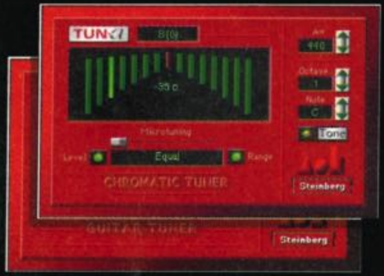
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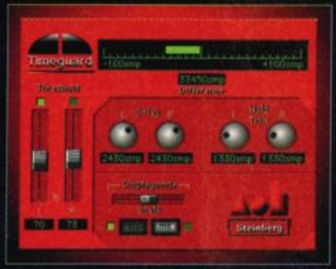
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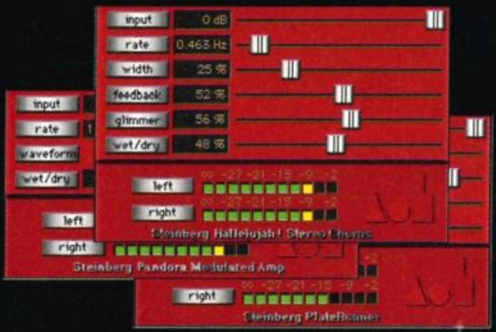
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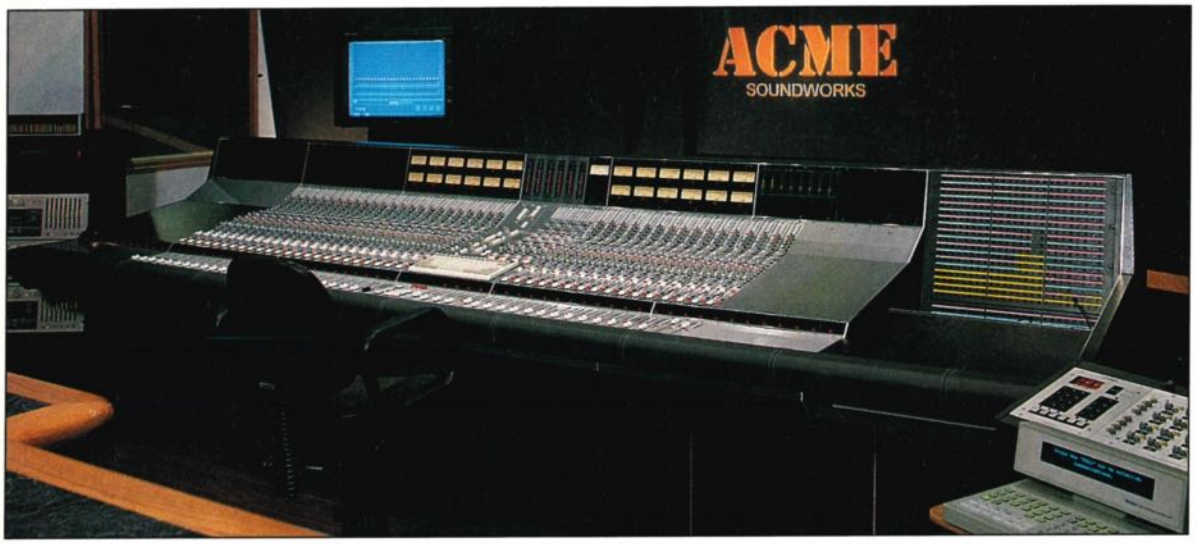

PHOTO: DAVID RAVANDI

Lafont Chroma installed in Studio A at Acme Soundworks, West Los Angeles

The Lafont Chroma is one of those truly rare consoles that have been designed specifically to fulfill a narrow range of tasks. Unlike many other manufacturers, who offer designs that can be used—they would have us believe—in a wide cross section of applications, Lafont has targeted the Chroma squarely at the post market: mix-to-picture and multiformat film/video post-production. And, as I discovered during extended sessions with the unit at a post house in Santa Monica, it's a claim that I find to be fully justified. The Lafont Chroma bristles with features that will make the life of a post or re-recording engineer a great deal simpler.

But, before proceeding, one pertinent question needs to be addressed—Who exactly is Lafont Audio Labs? The company bears the name of famed French designer Jean-Pierre Lafont, who for the past dozen or so years has been developing a series of TV/film post-production consoles. The current line, in addition to the Chroma reviewed here, includes the Privilege three-engineer dubbing board; HD-4 Visions large-format re-recording consoles; Esterel Series of ADR/Foley dubbing consoles; and transfer consoles for machine rooms. The firm also makes a range of rackmounting mic preamps, parametric equalizers, dynamics units and a telephone simulator. (In other words, Jean-Pierre Lafont is a kind of Gallic Rupert Neve.) All systems are built in Montreal, and receive a final assembly checkout from Sascom Marketing Group, the firm's Toronto- and L.A.-based North American distributors.

Whatever its origins, the Lafont Chroma packs lot of power into a compact amount of space. Basic circuit topology is an in-line design, with line- and mic-level inputs routing via the lower channel fader to a series of multitrack bus outputs, and then from tape machine returns to an LR/stereo or multiformat monitoring matrix via the upper bank of faders. Other circuit arrays, including subgroup stem outputs for pre-dubs and re-recording assignments, are also possible with this flexible design. The Chroma is supplied complete with a VCA-based Optifile Tetra automation system that controls channel faders and mutes; more expensive Uptown, Flying Faders or GML moving-fader systems are available as options.

BY MEL LAMBERT

The system I reviewed at Acme Soundworks in West Los Angeles was a hybrid layout: a 64-channel mainframe short loaded with 40 I/O strips; additional modules can be added in buckets of 12. A TT patchbay is standard. All I/O modules feature a full-function, 4-band parametric equalizer, plus a flexible dynamics section. Three types of input strip are available: Model 7252 with built-in mic preamp; and the Model 7253 with double line inputs that can be supplied with either a compressor/limiter or expander/gate section. Also standard on the design are four stereo input modules that can be used for conventional effects returns, or for stereo premixes and other 2-channel sources. Price for the system reviewed here is around $130,000; the Chroma line ranges from $85,000 to almost $185,000, depending on the number of input channels and specified automation package.

CHANNEL STRIP: FEATURES AND FUNCTIONS

At first glance, the Lafont Chroma bears more than a passing resemblance to the color scheme and stepped panel layout of a vintage Neve 8078, crossed with the system

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Small Plate	8 Voice Chorus	Guitar Amp 4	Inverse Expander	EQ-Panner-DDL
Large Room	Flanger	Digital Tube Amp	Ducker/Gate	EQ-Tremolo-DDL
Small Room	Phaser-DDL	Dynamic Tube Amp	De-esser	EQ-Vibrato-DDL
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Reverse Reverb 1	Speaker Cabinet	VCF-Distortion 2	Van der Pol Filter	Sine/Noise Generator
Reverse Reverb 2	Tunable Speaker 1	FuzzBox	Vocal Remover	ADSR Envelope Generator
NonLinear Reverb 1	Tunable Speaker 2	Guitar Tuner 2U	Vocoder 2U	Distortion-Chorus-Reverb
NonLinear Reverb 2	Parametric EQ	Pitch Shifter	No Effect	Distortion-Roto-Reverb
NonLinear Reverb 3	EQ-Gate	Fast Pitch Shift	Plate-Chorus	Wah-Distortion-Reverb
MultiTap Delay	EQ-Compressor	Pitch Shift-DDL	Chorus-Reverb	Compressor-Distortion-Flanger-Reverb
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topology and up-market features of an SSL 4000. The flat, lower bank of long-throw channel faders runs from a steeply-angled writing strip to the slanted section that houses short-throw monitor faders, EQ, dynamics and aux send controls, on up through another angled section that houses more aux sends and master multitrack assign buttons. Every control on the board was an easy stretch for me from a central seated position—or while standing if you need to reach some of the more distant channels. Cosmetics and color schemes are clear and unambiguous, with color coding of key knobs to help break up the front surface.

Two primary busing configurations are available: Mix mode and Surround mode. In conventional stereo Mix mode, access to the 24 multitrack or submix buses is via a bank of 12 buttons and companion LEDs, linked to a pan control that operates between odd/even buses. The monitor pan and fader now control the bus output/tape machine return balances into the left and right control room monitors. In Surround mode, the channel pan operates with true LCR pan laws, while the monitor pan controls front/back balances. As would be expected from an in-line design, Fader Swap enables the channel and monitor roles to be reversed.

In addition to multiformat mixing, a bank of six push buttons located (rather confusedly) on the corresponding channel fader route or re-assign the signal output from the monitor fader directly to the six monitor buses: left, right, center, left-surround, right-surround and sub-bass. Connections are also provided from the patchbay to allow a Dolby Surround or similar encoder to be inserted into the signal path, or to enable the console to interface directly to more exotic DTS and SR•D mastering systems. (Using a spare pair of auxiliary send buses, it should also be possible to provide a workable SDDS mix from the console, with independent control of the left-inner and right-inner loudspeaker busing.)

So, using just a couple of buttons, it is possible to create a normal stereo mix for simple mix-to-picture or music-scoring dates, or activate the various multiformat controls, and prepare a series of LCRS stems from music, dialog and effects sources, and/or combine these stems into a master 5.1 mix. Using the 24 available buses, up to six discrete LCRS stems or submixes can be generated within the console and laid off to separate record tracks. With just a few minutes' study, the Chroma's flexible output routing is very easy to follow and offers a high degree of flexibility.

Sources to each channel strip can be either mic/line; all species of channel strip enable one of three different inputs to be selected. In the case of the mic preamp-equipped modules, these are mic, line and bus; for line-level strips, the mic input is replaced by a second line-level source. The bus input enables a channel strip to serve as a subgroup master, with full EQ and dynamics, plus re-assignment to the output buses and multiformat destinations. The mic inputs feature a 26 to 70dB trim range, plus 48V phantom power and 20dB pad. The independent line-level inputs are provided with a useful ±10dB trim control.

EQ AND DYNAMICS

The EQ section comprises a sweep LF bell/shelving band with turnover frequency adjustable between 35 to 700 Hz; an LMF band from 100 to 2.2k Hz; an HMF band from 400 to 7k Hz; and a sweep HF bell/shelving band from 800 to 18k Hz. The fully parametric mid-frequency bands feature Q controls with 0.6 to 3 ranges. Cut/boost is 16 dB for all four bands. In addition, the line-only input strip features highpass (40 to 400 Hz) and lowpass (1.2 to 20 kHz) filters, with an in/out switch; the mic/line strip offers only the highpass filter. As would be expected, the EQ section can be inserted into either the channel or monitor path. (I would have preferred to have been able to split some of the EQ into each, but you cannot have everything, I suppose.) A post-EQ channel insert, accessible on the patchbay, is also provided.

In use, the Chroma's EQ section is smooth and musical. It offers a wide range of adjustment and lets you zero in on the frequency band very quickly and easily. Even when set to provide large amounts of cut and/or boost at narrow bandwidths, never once did the system cause any odd barks or squawks. And the detented controls enable identical EQ to be applied to stereo sources and recalled accurately from session notes. Speaking of which, a useful Link button causes the input signal on the selected channel to be dumped directly to its right-hand neighbor. The operation can be repeated several times, allowing an identical signal to be internally routed to several input strips and then equalized separately, for example, to allow automated crossfades between indoor and outdoor scenes.

The built-in dynamics section is very handy and uses VCAs fitted to each channel fader, controlled directly from the signal input. (Fader-swap can be used to control levels in the monitor chain.) Although the type of dynamics control that can be implemented is limited by the type of functionality specified on a particular channel strip—either compression/limiting or gating, depending upon the application—there is a solution. Full-function dynamics units can be added to empty areas of the left- and/or right-hand meter bridge, and then connected via the patchbay to the selected channel. These Model 832 double-width dynamics processor modules offer enhanced compression, limiting, gating and de-essing.

The upper Auxiliary Send section features a total of eight buses, fed either pre- or post-monitor/channel. Aux 1/2 and 3/4 are switchable as stereo send outputs, while 5 thru 8 function as independent mono sends. Usefully, aux sends 7 and 8 can be set to access the multitrack output buses, thereby providing an additional set of 24 aux sends via unused buses, or—more usefully—to directly access the LCRS outputs in whatever combination the user has selected.

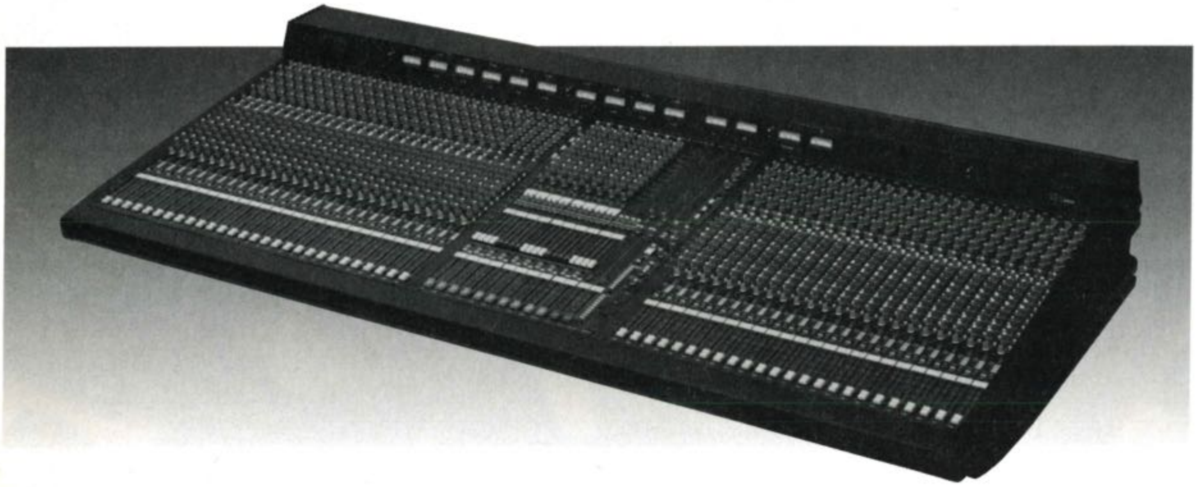
MASTER CONTROLS: FLEXIBILITY PERSONIFIED

The master control section is full of useful features and functions. Both left and right, as well as 4- and 5.1-channel multiformat monitor assignments, can be handled directly from the Chroma's master section, without the aid of outboard interfaces. A variety of sources can be routed directly to the control-room monitors, including mastering decks or the 2-track mix. Outputs to a pair of dedicated foldback sends destined for the musician headphones and/or studio playback can be selected from aux sends 1/2, 3/4 or 5/6, the stereo mix or the LR components of a multiformat mix. A 6-frequency oscillator can be routed directly to the mix buses or the multitrack buses for slating. Comprehensive talkback is also provided.

Metering comprises six high-resolution bargraph units that display levels of the L, C, R, SL, SR and sub-bass buses, plus a user-selectable choice of VU or peak-reading units for the multitrack buses. Independent metering is also provided for the eight aux sends. Ballistics of the main bar graph units can be set to VU or peak response.

RAMSA WR-SX-1

SOUND REINFORCEMENT CONSOLE



The Ramsa WR-S840 console created a standard for quality and flexibility when it was introduced a decade ago. It remains one of the most universally accepted monitor desks, and many prefer it for mixing house over FOH consoles of its day. The robust grounding scheme, which brings all XLR pin 1 and phone jack sleeve connections to a solid, heavy ground bus (the "big green highway") to reduce buzz, hum and RF interference, has been widely imitated by other manufacturers. Its padless mic preamps were designed to accept a range of signals, from low mic to high line-level.

Ramsa's new WR-SX-1 is a 20-auxiliary, 10-matrix console. Available in 48-input versions with four additional stereo line input modules, it can also be short-loaded with eight blank modules. A total of up to 52 input strips can be loaded into the largest frame, which lists for $69,900. Any number of additional stereo line inputs can be swapped for mono mic modules. Considering there are 20 auxiliaries, a minimum of eight stereo inputs are recommended. And as Panasonic is a supporter of the Olympics, anyone working in Atlanta this summer may suddenly find themselves mixing on one. My first tip is don't read the manual; the translation to English from Japanese engineers isn't always clear. The console itself is quite nice, however.

Dave Cutter of Sundown Sound (Portland, Oregon) owns an SX-1/48. I had the opportunity to use it at a recent Kool & the Gang show at Portland's new Rose Garden arena, along with Sundown Sound's Cal Perkins-designed, Crown-powered, three-way, two-box speaker system. The 48 mono inputs, plus four stereo inputs were enough for a ten-piece band, plus the opening act. Using the 20 auxes to assign an alphabet-soup of ten digital effects and reverbs, I was able to assign in stereo as needed. Effects can be dedicated to different instruments and then grouped along with those inputs on the VCAs. And having ten VCAs also allowed enough separate assignments for the radio station's DJ and for vocal effects.

The SX-1 is a "VCA" console, with mix control grouping received from ten VCA faders. Inputs simply have an L/R assign below the pan knob. If submaster audio grouping is needed, an additional 20x2 assignment matrix on the main stereo bus allows any auxiliary to become a submaster. On each input, the first dozen aux pots have "CAL" detents at the maximum level position, and pressing the assign switch next to them applies the signal to the bus like a normal house console. Any combination of subgroups or auxiliaries, up to a total of 20, is available.

BY MARK FRINK

The first six concentric aux pairs (1-12) are "level-and-level" only. Four internal DIP switches change the last four stereo aux pairs (13-20) from concentric L/R level pots to "level-and-pan" to simplify the creation of up to five stereo mixes for, say, in-ear monitoring, including the main stereo bus. Of course, additional stereo mixes can be derived, using lower-numbered aux pairs, without the facility of panning. Two more switches inside each module select aux 1-12 and aux 13-20 to be either pre- or post-EQ as a group.

The EQ is great. The mono input module's 4-band, fully parametric equalization has Q adjustment from 3.0 to 0.5, and the high and low bands can be switched to shelving. A new, natural-sounding EQ circuit architecture uses extra op amps to change the way the filters are shaped at their widest, providing gentler slopes and lower phase-shift. The 12dB/octave high-pass filter sweeps up to 400 Hz.

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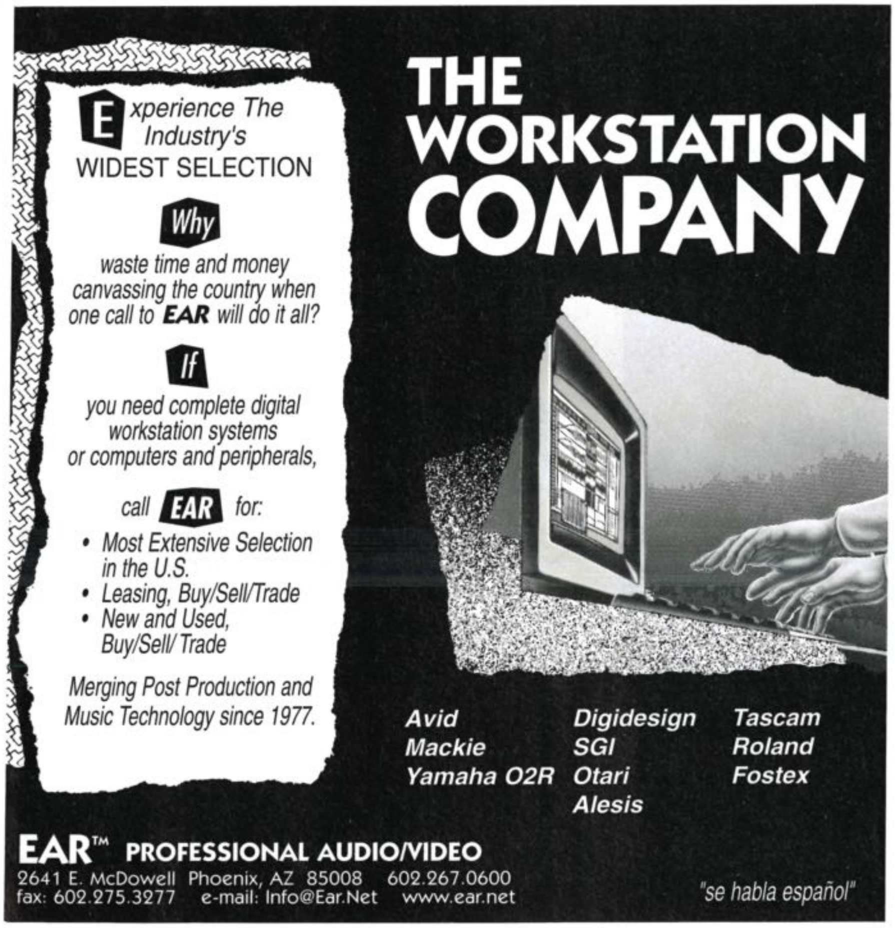

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optimum results. Kick the beast into multiformat mode, however, and the options become even more exciting. Because of the way the Chroma is laid out, it soon becomes obvious that there are several ways of achieving the same result. For example, instead of using the LCR and split-surround output assignments from the monitor fader, it is possible, as I discovered, to pan and route outputs from a channel directly to, let's say, buses 5 and 6. Now, using the corresponding Bus switches on the appropriate channel strip, we can pick up the signal and route it to the relevant monitor output.

The Chroma's built-in VCA-based Optifile Tetra automation is easy to set up via the color VDU and keyboard commands; an infinite number of mute groups can be set up using the Status push button fitted to each channel strip. Various update/reset modes are also available for the level automation, several of which behave like moving-fader systems during relative and absolute take-over modes. For the money, Optifile Tetra offers excellent value.

All in all, the Lafont Chroma surprised me with its flexibility and creative power. The EQ sounds sweet, and the dynamics, despite a couple of minor limitations, are very useful. But it's the powerful combination of stereo and LCRS routing plus the enhanced multi-format monitor assignments that propel this French-designed console onto a higher plane. At the price, I can see few reasons why the Chroma would not provide a perfect mixer for smaller-format mix-to-picture and video/film re-recording suites, where value for money is a crucial factor in the purchasing decision, but creative flexibility is equally important.

•••

My sincere thanks to Jerry Ross and his talented crew at Acme Soundworks, Santa Monica, for access to the facility's new mix-to-picture room, equipped with a 40-input Chroma console and Optifile automation.

Lafont Audio Labs, distributed in North America by Sascom Marketing; 34 Nelson St.; Oakville, Ontario, Canada L6L 3H6; phone 905/469-8080; fax 905/469-1129. ■

Formerly editor of Recording Engineer-Producer *magazine, Mel Lambert currently heads up Media&Marketing, a consulting service for pro audio firms and facilities.*

Also contained within the central monitoring area are master level controls for the eight aux sends, plus individual controls for the four additional stereo input modules. In addition to pre-fader access to the aux buses, each stereo module is provided with a simple 3-band, fixed-frequency EQ section.

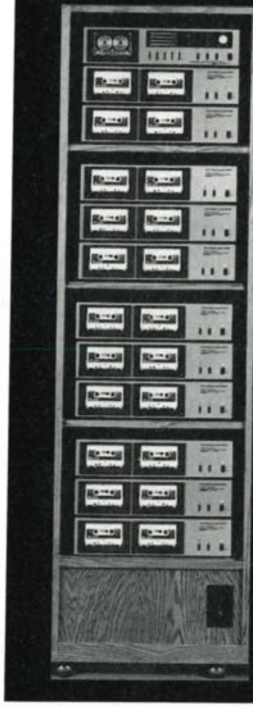
Three Solo modes are available: Normal or AFL Mode, which affects both the channel and monitor sections; Solo-in-Place, for destructive soloing; and Split, providing separate monitor and channel solos. Although the AFL monitor levels are normally calibrated and left alone, a useful UNCAL switch allows the level to be adjusted to suit the user's specific requirements.

Finally—and I have purposely been saving this for last—the Chroma boasts a very useful master bus/tape switcher panel. This feature enables arrays of I/O modules to be set to one of three master groups—labeled A, B or C—and then flipped between bus sources and off-tape replay (for example, although any playback format would apply) as a multichannel/multistem mix is being made. Individual solo, mute and tape/bus selection is provided per group, with master controls. A useful Freeze button allows access to any or all group film/bus commands to be locked out.

Although it wasn't fitted to the Chroma I evaluated, a complete track arming, record and motion-control panel is available as a system option. The 860 Module, located in the fader bay below the master section, can be interfaced to any type of recorder, I'm informed. A bank of 24 keys provide access to record/safe functions, master record on/off and conventional transport modes. (These basic functions could also be provided on a multitrack remote control unit, for example, or via an outboard system such as TC Systems' PicMix, which incorporates a set of transport controls and microprocessor-controlled solo, mute A/B and record/safe functions.)

IN-USE ASSESSMENT

As I discovered during an extended evaluation session, the Lafont Chroma is remarkably easy to understand and configure. In conventional stereo recording, overdub and remix modes, the system is a breeze. The EQ section is flexible and sounds great, while the built-in dynamics linked to the channel VCA are simple to adjust and provide



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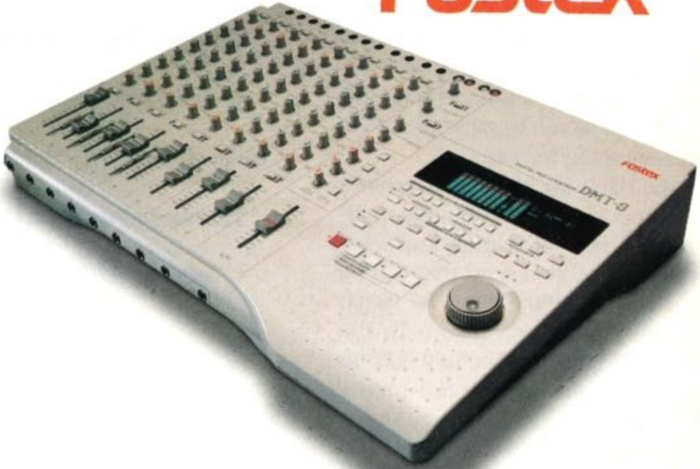

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INPUTS

The channel strip has two inputs; main and SUB. SUB enables monitoring of recorded tracks during recording or can be used as a line input during mixdown. Channels 1-4 also have the addition of a 'wide-range' trim fader (-10dBV -50dBV) for perfect mic level matching.

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Fostex Corporation of America · 15431 Blackburn Ave · Norwalk, CA 90650 · (310) 921-1112 · Fax (310) 802-1964 stereo line-level returns, and have no highpass filter, no phantom power and only 20 dB of gain. The EQ is a stereo version of the 840's equalizer. Internal switches allow auxes 1-20 to be switched, in groups of four, to send the input either in stereo to pairs of auxes, or mono-summed to both.

On the back are the usual professional connectors. The mono mic modules have a pair of ¼-inch jacks for inserts, plus a second send that can be used as a post-EQ line out. The stereo line modules have no insert. In the master section, the 20 auxiliary outputs have inserts, but not the ten matrix outs. In addition to the master stereo outputs, there are also stereo sub outputs and inputs, both XLR, plus an RCA record output. Mix, auxiliaries and the solo bus can be linked from a second console using TRS balanced ¼-inch jacks. There are two power supply connections, which must both be used, as the console requires two PSUs to operate, drawing 11 amps together.

As Panasonic is a supporter of the Olympics, anybody working in Atlanta this summer may find themselves mixing on a WR-SX-1.

MUTE GROUPS AND VCAS

Inputs can be assigned to one or more of the ten VCA subgroups and ten mute groups. Unlike consoles with rows of switches or rotary selectors, assignments are made using each channel's On button and a corresponding red Check LED beneath it.

To check a VCA, simply push the Check button over one of the ten VCA faders. The small, red LEDs on channels assigned to that VCA light up. To change these assignments, push the gray Edit button on the master module. The LEDs on channels assigned to that VCA group flash. Pressing the On button on individual inputs assigns or deassigns them to the VCA group. Pushing the lower Enter button on the master module then rewrites that group. Easy.

Assignment to mute groups is similar, but slightly more confusing. This is being addressed and will be corrected in newer consoles. To check mute assignments, push one of the ten Check buttons on the master module and the red LEDs on channels not assigned light up. This is opposite of the VCA assign indication and is counter-intuitive. Channels turned off cannot be assigned to a mute group, so before starting to assign channels, they must be turned on. Pushing the Edit button next causes LEDs on channels not assigned to flash. Again, toggling the On button on each input assigns it, and pushing the lower Enter button locks in the setting.

HOUSEKEEPING UTILITIES

Numerous test and diagnostic modes are available. Each of the 52 input modules has a frame location address, programmed with an internal DIP switch located under the fader. Pushing the first mute group Check button allows channel address settings, programmed on the DIP switches, to be verified.

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Pushing each channel's On button displays its address in the three-digit display.

MIDI control parameters are extensive. The first sets the MIDI channel to Off, Omni, or channels 1-16. The second turns the output copy mode on, allowing parameters or scene memory to be sent from one console to another. The third allows the console to enter FOH mode for dual interlocked operation, and mute group information is sent along with the memory number of program change commands. The console can alternatively be put into "bnH" mode, in which Lock information is also sent; channel on states are sent each time one changes, as are VCA levels when they change by more than 0.4 dB. The fourth dumps data. The sixth actually takes the computer offline completely.

CONSOLE AUTOMATION

The SX-1 has 128 "scenes" of MIDI-controllable "snapshot" automation of all input fader settings. The SX-1 operates in one of two modes, either manual or automated. Manual mode is verified by the first two decimal points on the three-digit numeric display being lit. Manual mode is entered by holding down mute group Check button number 10 while pressing the Edit button. You'll probably run it in manual the first time you use it, especially for one-offs. A green level match LED is used to match a channel's fader to the internal level of the current scene's memory. This is available in either mode, so even if an event is mixed manually, information in scene memory can be used as a convenient guide for level setting. Each time a scene is changed, the MIDI command can be used to drive effects and other MIDI gear presets, such as EQs or inserts.

For theatrical presentations or tours where repeatability is desirable, the automation will be invaluable. Scenes can be written in technical rehearsal in manual mode, verified at dress rehearsal, and the show can then be repeated over and over. Any channel's automation can be overridden while a show is running by setting an input fader at "nominal" zero and pressing the Update button above it. This activates that fader, adding or subtracting from the fader's internal scene level. By putting any or all faders at zero and pressing Update, live override of automation is constantly available. Alternatively, inputs can be removed from scene control by pressing the "Man" button.

To program automation, undo the memory lock and put the console into manual mode. Assemble the mix and press the Write button. Select the scene number in the three-digit display and press the top Enter button. The rightmost decimal point indicates storage of the current state into the current memory location. More scenes can be written by assembling subsequent mixes and repeating the last two steps. Third-party librarian software is in the works.

To summarize, the Ramsa WR-SX-1 console is a rugged, great-sounding professional mixer with some features that may take awhile for the average user to take advantage of. But even when running the console in manual mode, it still has more flexibility and mixing power than many users are likely to need. Yet at the same time, the WR-SX-1 provides a technology platform that will grow into a wide variety of sophisticated tasks as its operators become familiar with it.

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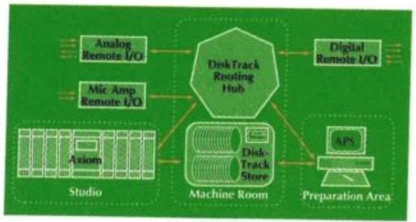

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BAG END LOUDSPEAKERS STUDIO-A

MONITOR SYSTEM

BY GEORGE PETERSEN

The field of studio monitor design is fraught with recycled ideas, and truly new concepts rarely come along. So when Bag End—an innovator in subwoofer technology for studios and touring rigs—announced that it was developing a full-range studio monitor system, I was interested. And true to form, they've come up with a clever new approach.

The system is available in two standard packages, Studio-A and Studio-B. Both combine two MM-8 mid/high cabinets and one or two subwoofer boxes using Bag End's patented ELF (Extended Low Frequency) technology. ELF also requires a Bag End system integrator, a single-rackspace processor that installs between the mixer and ampifiers, providing active equalization, frequency dividing and speaker-protection functions.

BAG END
TIME-ALIGN

The Studio-A system pairs two MM-8 coaxial monitors, two subwoofers and an electronics controller.

Designed for mastering facilities, larger control rooms and film-mixing stages and priced at $5,584, Studio-A includes two MM-8s, an ELF-1 system integrator and two D10E-S double-10-inch subs for performance down to 8 Hz. Intended for smaller studios, postproduction suites and project rooms, the $3,368 Studio-B has two MM-8s, but substitutes the ELF-M integrator (fewer crossover controls and a single mono sub output) and comes with one D10E-S subwoofer that goes as low as 18 Hz.

Although the MM-8s are also sold separately, they are optimized for use with a subwoofer. By selecting other ELF subwoofer products in the Bag End line, users can custom-configure a system to just about any specific application.

The MM-8s use a single 8-inch coaxial driver, mounted in a 12x18x8-inch ported enclosure. Mounted on the rear of the woofer is a full-size, 1-inch throat compression driver. The woofer cone forms the outside of the HF horn flare, so the dispersion is extremely wide.

The MM-8s have a variety of useful front panel controls. An absolute polarity switch allows for a quick check of the acoustical polarity of program material. An EQ switch offers the choice of three brightness settings. In most applications, I preferred the Nearfield™/Final setting, which seemed most natural when listening at close quarters, with the monitors placed on the console meter bridge. By the way, Bag End markets a number of mounting options for the MM-8s, including adjustable floor stands and wall-mounting plates.

The ELF-1 dual-channel controller is a complex device, with 45 DIP switches per channel crammed onto its front panel. It's somewhat intimidating, but once you're set up, you have no need to change the controls again. A security cover is included to keep prying fingers off your favorite settings. The ELF-M (mono subwoofer output) eliminates the 90 switches and replaces them with factory set parameters suitable for most applications.

Installation is fairly simple and requires two channels of amplification for the MM-8s and another amp to drive the sub(s). The MM-8s have a sensitivity rating of 93 dB (1 watt/1 meter) and perform nicely with a 150- to 200-watt/channel amp. The D10E-S sub has a rather efficient 94dB (1W/1m) sensitivity at 80 Hz, but this rating plummets to 71 dB (1W/1m) at 20 Hz. Obviously, to get the maximum benefit out of an ELF subwoofer, you'll need LOTS of amp power. With stereo subs, I used a 450 W/channel amp, which proved ideal.

Be warned. If you're used to mixing on typical near-field studio speakers, you're in for a shock when you use an ELF system for the first time. Suddenly, you'll actually hear the rumble, grunge, dirt and LF clatter (such as air-conditioning systems, background subways, earthquakes and A-bomb tests) that show up on your digital recordings, and you may not be happy with what's on the tape. However, because you're actually

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I tested the stereo subwoofer Studio-A system. In my small, irregularly-shaped 17x17-foot control room, a single D10E-S sub provided plenty of punch. Of course, the correct amount of bass is subject to taste. Most of my work is pop and acoustic albums and broadcast production; I suspect that rap and hip hop producers would really go for the dual-sub system even in smaller control rooms. The crossover's transition from the subs to the MM-8s was absolutely free of any harshness or other artifacts, and the balance of bass to MF and HF elements was even and accurate, whether mixing jazz, rock or broadcast material.

Above 100 Hz, the MM-8s are smooth and quite flat, even extending beyond 20 kHz. The passive dividing network that crosses the woofer to the HF driver is also smooth, and the 2.9kHz crossover point is high enough to keep out of the critical 1.5 to 2.5kHz vocal range. I wasn't wild about the shape of the MM-8 enclosure. Standing up, it seems a bit top-heavy; perhaps a deeper, less-rectangular shape could provide more stability while retaining the same internal volume. The dispersion, however, is very nice: When mixing on the MM-8s, the sonic character of the system doesn't change just because you reached to EQ that kick drum in channel 1. The "sweet spot" at the listening position is quite wide, yet the combination of MM-8's point-source design and Ed Long-developed Time Aligned™ crossover provides excellent stereo imaging.

Overall, the Bag End Studio-A system is a winner. With an 8 to 20k Hz response, this is probably the widest-range monitoring system on the market. And in today's studio environment, where more and more gear is being pumped into ever-smaller control rooms, post suites and remote trucks, size is a major consideration. At $5,584, the Studio-A system is definitely not for everyone. Fortunately for those on a budget, the (single-sub) Studio-B provides 90% of the larger system's versatility at a more affordable $3,368.

Bag End, manufactured by Modular Sound Systems; Box 488, Barrington, IL 60011; 847/382-4550; fax 847/382-4551. ■

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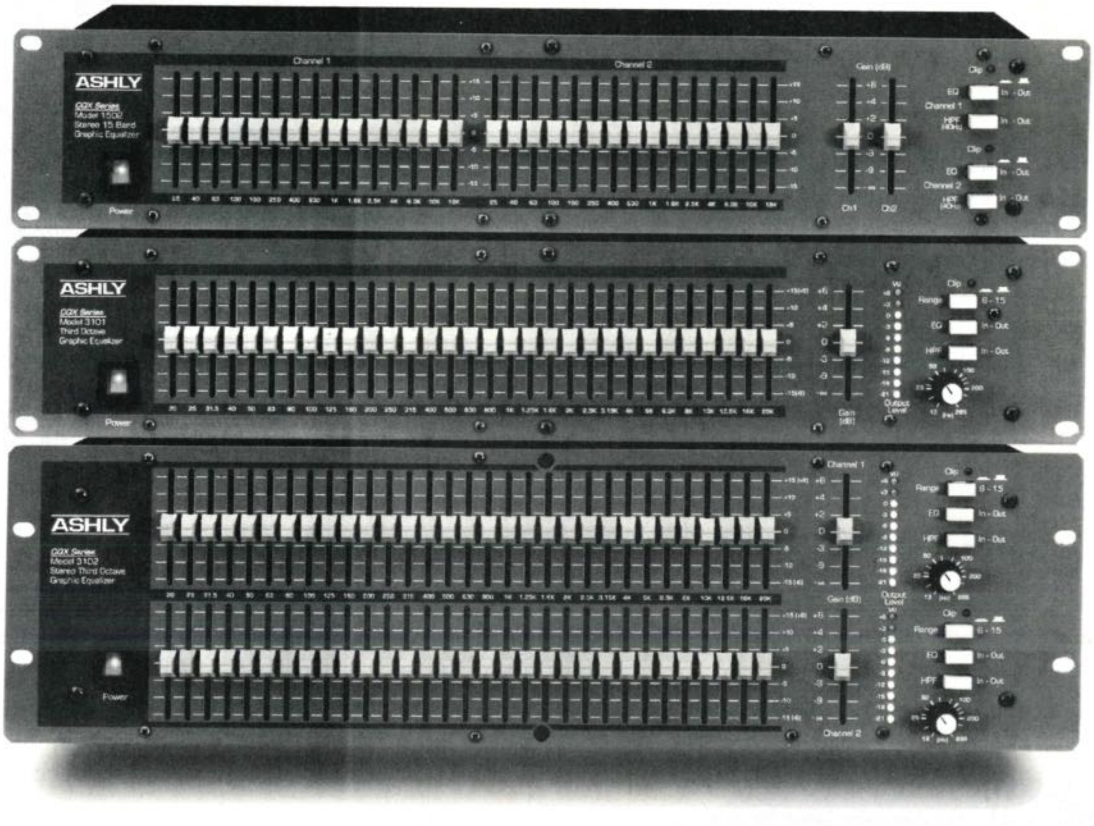
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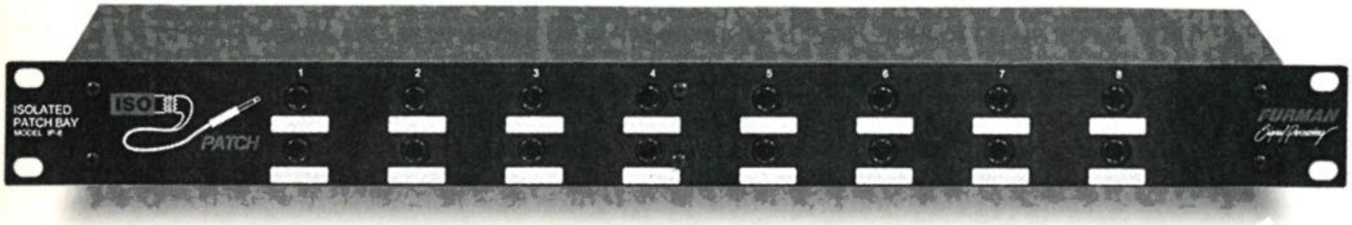

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How does an Iso-Patch work? Simple. Each of its input/output module features a low-distortion isolation transformer, which isolates line level audio signals, breaks ground loops—and puts an end to those annoying noises.

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ATH-M40 AND ATH-D40 STEREO HEADPHONES

Audio-Technica has introduced the lofty name "Studiophones," but essentially the ATH-M40 and ATH-D40 are stereo headphones designed for recording studio applications. The M40 is intended as a studio reference for general monitoring purposes. The D40 provides a bass-enhanced response for performer cue monitoring of drums, bass and other LF-rich sources.

Both models are sealed-back, dynamic element designs. The 40mm-diameter (1.5-inch) drivers have neodymium magnets and copper-clad aluminum wire voice coils. Each pair terminates in an 11-foot cable with a standard TRS ¼-inch headphone connector. No miniplug adapter is provided, which is something of a necessity when using headphones to monitor from pocket DATs, portable CD players or CD-ROM drives, so if you need an adapter you'll have to shell out your own buck. One nice touch is the fact that the wiring is OFC (oxygen-free copper) litz wire, a plus I didn't expect to find in medium-priced headphones.

The M40 model has a stated frequency response of 5 to 28k Hz, with a 100dB sensitivity and a medium impedance of 60 ohms. Surprisingly, the LF-enhanced D40s have less deep bass response with a 20 to 28k Hz bandwidth, a 102dB sensitivity and a 66-ohm impedance. However, the D40s do have a substantial bass boost in the slightly higher 80 to 120Hz range, where the bulk of what we perceive as bass does occur.

Physically, the Studiophones are fairly lightweight at 8.8 ounces, not counting the cable. Both the headrest and earcups are padded with faux-leather vinyl cushions that remain comfortable even after extended listening periods. Another aspect of headphone fit is making sure that they stay snug while you're moving, which is no big deal if you're sitting behind the board in the control room. But when you're doing a live mix and are moving around a lot (especially during mid-show crises), this is a big deal. I also do occasional gigs as a session drummer and had a chance to check the D40s from the musician's perspective. Fortunately, the Studiophones stay in place securely without resorting to that "head in a clothespin" effect of some other headphones. And the circumaural (around-the-ear) earcups and sealed-back design effectively keep nearly all of the headphone sounds from bleeding or leaking into the audio environment.

ATH-M40
audio-technica
ATH-D40
audio-technica

Audio-Technica ATH-M40 Extended Response Precision Studiophones and ATH-D40 Bass Enhanced Precision Studiophones

Either earpiece can be rotated 180 degrees for single-muff operation. Unfortunately, this position is not very comfortable over long periods. In most studio cue mix situations over the years, I've found that when the performers start trying to listen through one earpiece, it's a sure sign that your monitor mixes aren't what the performer is looking for. However, there are other situations, such as location recording, where single-muff operation is not only desirable, but an essential part of surviving in dangerous environments.

BY GEORGE PETERSEN

Probably the most desirable aspect of the Audio-Technica Studiophones is that they provide the equivalent of an additional monitor send, especially in studios that only have one or two pre-fader sends or are otherwise limited in monitoring capability. For example, if you're recording a live ensemble in the studio and only have two monitor mixes available, you'll probably use one mix for the vocalist and another for the rest of the band. Meanwhile, you've just made enemies with the drummer and bassist, who need a little more bottom end in the cans. By providing the bass-enhanced D40s to those players and M40s to the other players, you've effectively created three monitor mixes out of two.

With a sensitivity in the 100 to 102dB (1-watt) range, the Studiophones pack plenty of punch and are quite loud, even when driven by the puny headphone outputs of most DAT decks and CD players. The M40s exhibit an accurate blend of LF, mids and HF elements; the bass is tight and well-defined, and the highs have a nice sheen that's crisp rather than brittle. The D40s exhibit similar midrange and HF response, and the bass has its previously mentioned bass bump. Retailing at $175 a pair, anyone looking for quality studio headphones should give these a listen.

Audio-Technica U.S.; 1221 Commerce Drive; Stow, OH 44224; 330/686-2600; fax 330/686-0719. ■

FACILITY SPOTLIGHT

SPOTS BME

OFFLINE VIDEO, ONLINE AUDIO

by Tom Kenny

PHOTO: BARRY ELZ

PHOTO: WILLIAM BIEDERBOST

PHOTO: JOE DORIA

Clockwise from top: The audio room at Spots BME; Bruce Frankel, president; Shawn Ballman, audio engineer.

In this column, *Mix* has regularly documented the trend of high-end video houses putting in high-end audio rooms. The idea is simple and efficient: to keep all creative facets of a commercial project in-house and generate additional revenue. For a video facility, the addition of audio editing/mixing is not that expensive a proposition, and with the right talent behind the board, the move can pay off dramatically in terms of client comfort and service.

But, rarely have we come across a video offline house with an audio room to match the one at Spots BME in Chicago. Marketed as a creative video editing "boutique," with clients like United Airlines, Hardee's, Sears and Miller beer, Spots BME has seen rather astonishing growth since owner/picture editor Bruce Frankel opened up in 1990, in what is considered one of the world's tougher commercial editing markets. In February 1995, Frankel moved to a new 5,000-square-foot space on Erie Street, 1,200 square feet of which is occupied by the Russ Berger-designed audio room. (The facility also includes three Avid suites and a ¾-inch offline suite.)

"I started this company in a very small, personal way, with a couple of small rooms in a rental facility," says Frankel, who has been in the film editorial business for 17 years and spent the mid- to late-'80s at Optimus. "We rented out a KEM, and I had a video offline system. I did all my own track work on the KEM—dubbing off sound effects and music and voice to mag tracks and cutting it, as most of the editors did. Then we would go to a recording studio and mix from mag tracks. Although the recording studio's engineers performed the final mix, I still did the creative part of cutting the tracks and lining them up against picture, making the audio work.

"As we got more into video editing, that whole process of track layup kind of went away because I couldn't really cut the tracks like I did in the past," he continues. "I thought, 'Well, I still want to retain that part of it,' so I bought an AudioFile back in the summer of 1990."

At that time, and to some extent still today, Chicago was an AudioFile town, much the same as New York is a Sonic Solutions town. Editel purchased one of the first 'Files in North America back in the late 1980s, and

—CONTINUED ON PAGE 167

"Sound for Film" columnist Larry Blake is taking a break this month. He will return next month with Part Two of "Ready or Not, Music Industry: Here Comes Surround."

SCORING IN DOG YEARS

ELIAS ASSOCIATES FIGHT ON

by David John Farinella

Jonathan Elias had damn near made it out of the hustle and bustle of the commercial scoring world alive. He had already begun working on film scores, with credits on a number of features. He had jump-started an album production career with his work on records by Yes, Duran Duran and Grace Jones. It had been five years since he had even thought of a 30-second spot, until he ran into the innocently named David Fincher. That name may ring some bells, considering Fincher directed one of the recent Brad Pitt-athons, *Seven*. Back then, though, Fincher was directing a commercial and looking for music. Lo and behold, he found Elias. "Just when I thought I was out, he dragged me back in," Elias says with a smile. "I was heading back into my film and record career, but I got waylaid into commercials for the past three years."

And what a three years it's been. After teaming up with brother Scott and longtime accomplice Alex Lasarenko (who runs Elias' East Coast Creative Team), Elias Associates has succeeded in creating a whole new world of commercial scoring. They've garnered a number of industry awards, including 21 Clios (most recently, for best music, Elias and Chip Jenkins), 23 Cannes Lions and Best Music House in the Business in the Backstage Reader's Poll for the past two years, to mention just a few.

Jonathan Elias

The team has set and stocked studios on both coasts for one main reason: "In the commercial world, New York and Los Angeles are the two strongholds," Elias explains. And now, with the availability of ISDN lines, the two studios regularly share sounds and information to satisfy their client base, which has included the California Milk Advisory Board, IBM, Levi's and Mercedes-Benz, and a number of others. The other reason for being on both coasts, Elias says, is that although New York is the mecca for agency work, a lot of the actual production and shooting is done in Los Angeles.

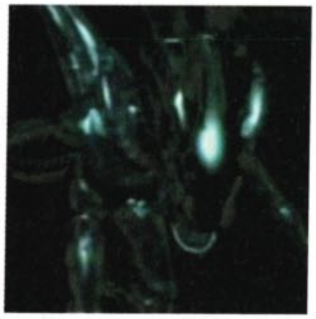
And so, in Los Angeles, Elias West is filled with four composing teams. On tap is

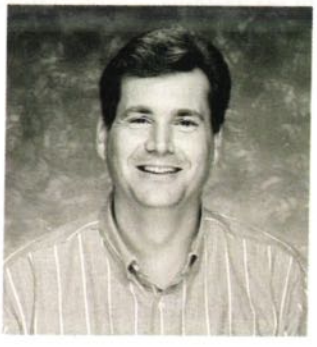
—CONTINUED ON PAGE 162

ALIEN TRILOGY'S SONIC UNIVERSE

by Evan Ambinder

Until last year, Mixed Nuts' Peter Buccellato had never worked with aliens. But when Acclaim Entertainment approached the New York post-production facility with the opportunity to design and mix sound sequences for *Alien Trilogy*, its new CD-ROM game, Mixed Nuts saw the chance to augment its TV and radio spot post-production with CD-ROM sound design.





Left: Peter Buccellato of Mixed Nuts; above: stills from Alien Trilogy.

Based on the hit *Alien* movie series, *Alien Trilogy* is a 3-D animated game for the Sony PlayStation, Sega Saturn and Windows 95, where the player (Riley) battles vicious creatures on a hostile planet in pursuit of the Queen Alien. Using one of Mixed Nuts' SSL Scenarias, mixing engineer Buccellato, game producer Cliff Falls and Ac-

—CONTINUED ON PAGE 168

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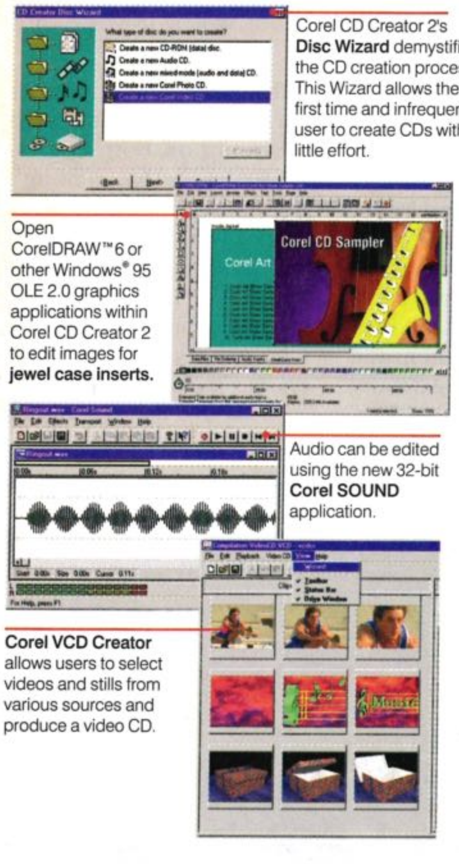
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TIMECODE CAVEATS

WHAT TO LOOK FOR IN DIGITAL AUDIO POST

by Evan Chen

The onset of the digital era within the post-production community has ushered in a new batch of technical problems, especially concerning synchronization and timecode. Although the basic rule-of-thumb is to resolve all equipment requiring timing information in phase to a common derivative clock source, critical problems remain, ranging from common theoretical concepts to obscure idiosyncrasies of particular digital audio equipment.

Let's look at a few of these problematic issues based on what I feel is their potential in aiding in the diagnosis and correction of timing inconsistencies in today's post-production process. This article emphasizes equipment-related specifics, which in terms of potential usefulness will never replace a firm grasp of the theoretical fundamentals. Every effort has been made to complement key points with a practical application or an example, and few specific products will be cited in order to maintain a general applications approach.

The term "29.97 timecode" is heard every day at post-production facilities and continues to be misconstrued. Primarily a problem of nomenclature, 29.97 timecode usually—and most of the time correctly—translates as 30-frame timecode running at NTSC color video (approximately 29.97 frames per second), with a 29.97 sub-code identifier (a flag indicating how the media was originally formatted) if applicable. Most digital audio recorders make this timecode stamp accessible under a remote item, commonly referred to by manufacturers as "tape tc," buried beneath layers of submenus. The exception is that even though the identifier may indicate 29.97 timecode, the flexible nature of digital audio machines nowadays allows one to pull-up or reference the timecode rate to a true 30 frames per second. For example, to return final film mixes completed in the video domain back into the film realm, many timecode DAT machines will resolve a DAT pre-striped with 29.97 code to an external 60Hz pilot tone or an NTSC monochrome 30Hz video signal. In this instance both audio and timecode have been pulled-up to compensate for the timing discrepancies in film-to-tape transfers, and the timecode outputted from the DAT machine is now running at 30 fps even though it still displays the magic number 29.97! Many of us are familiar with 30-frame timecode running at 29.97 fps, but few realize that the opposite case is also true: 29.97 timecode can actually function identically as 30-frame timecode, the difference being only in the flag.

Also remember, 29.97 timecode does not cycle from 00:00:00:00.00 to 00:00:00:29.96 and then "start over" at 00:00:01:00.00 to 00:00:01:29.96, and so on, a logical assumption but a common misconception. On the same note, 29.97 timecode is not to be confused with drop-frame timecode; these are two different concepts! Drop-frame is a type of timecode that regularly deletes frame numbers (108 per hour, occurring at the end of each minute, except for the 10-, 20-, 30-, 40-, 50- and 60-minute marks).

CHECK THE OUTS

Unlike traditional analog tape recorders, where an audio or ancillary track is used for timecode, many timecode DAT machines and other digital audio gear allow the output of *any* type of timecode running at selectable rates, regardless of how the DAT was initially striped. Oftentimes, operators overlook this option and hastily—and unprofessionally—conclude that the media was timecoded inappropriately. This was the case on a recent freelance picture scoring gig of mine, in which a sound editor from one of the most reputable television post houses in New York mistook my final DAT mix for drop-frame timecode. It was an embarrassing and uncomfortable situation for all of us, including the director and producer, when later I had to correct the sound editor literally with the turn of a dial.

Furthermore, many digital audio tape recorders allow the outputting of timecode derived from its control track (a sector of information the machine uses to keep things running smoothly, supposedly transparent to the end-user), regardless of whether timecode information actually exists on its dedicated track or not. Those swearing to have prestriped tapes may have actually been working with the timecode derived from their control tracks, so if the numbers seem wrong playing back on another machine, revisit your timecode-out options. I once dealt with some musicians claiming to have been working with timecode who brought in their film score on DA-88 tapes. After careful examination, it turned out that none of the tapes were prestriped and that the artists had been strictly using timecode derived from the control track in conjunction with a huge list of timecode offsets for cue start and stop times.

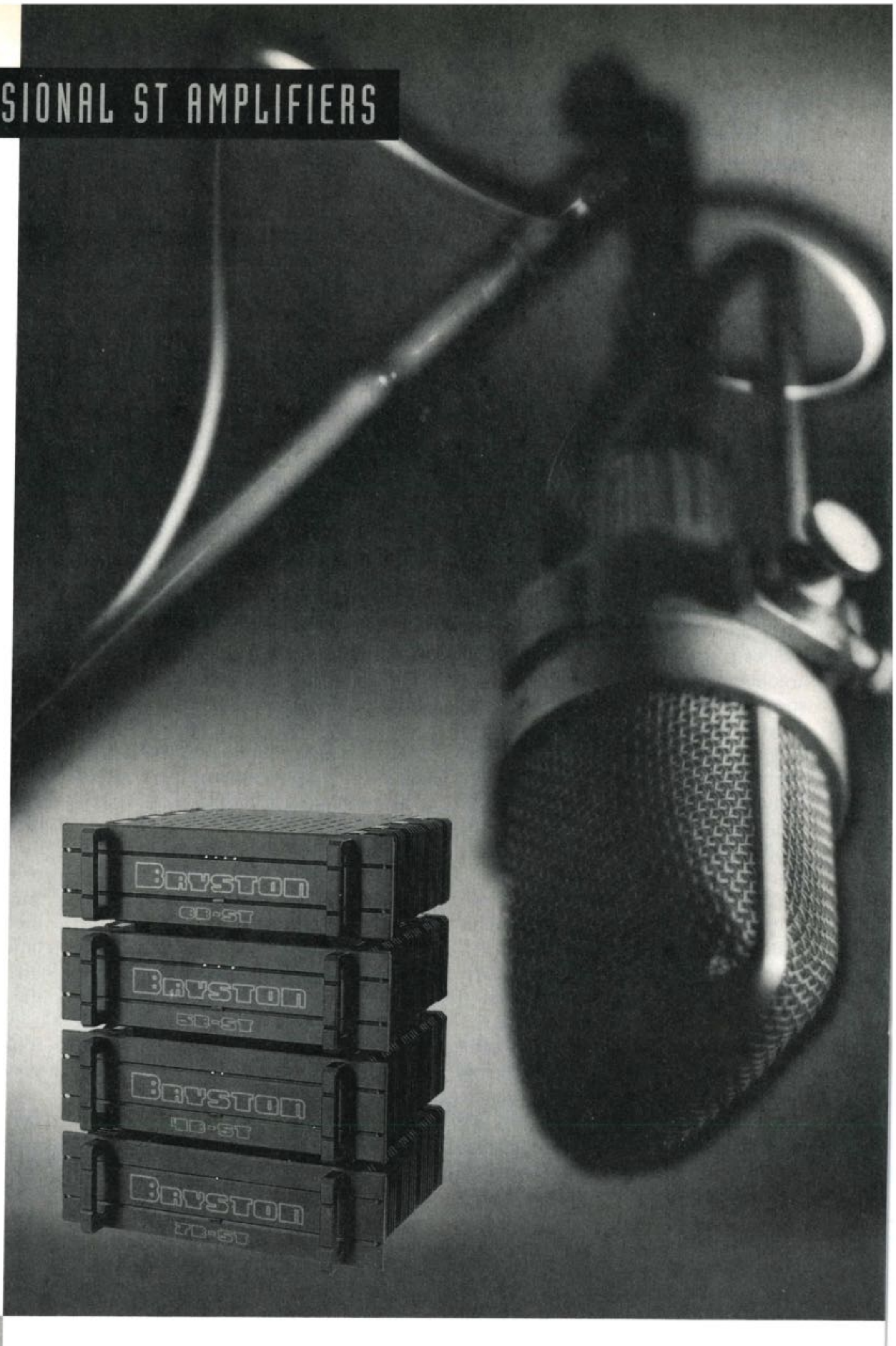
DEALING WITH PHASE

I frequently encounter timecode problems related to phase, which can occur in any setup that involves an external clock. For mix houses, this most often happens on a session in which the master synchronizer controlling several transports at once indicates that the timecode from one of its machines is consistently offset by a particular number of subframes and consequently refuses to "lock." A film mix, for example, might consist of Motion Worker locking a Beta SP deck, timecode DAT player, digital 48-track, DA-88, and a digital audio workstation running in VTR emulation mode—five transports that must march to the same drum. On a smaller scale, home project studios—especially ones that need to synchronize to picture (scoring, sound design, etc.)—using any professional videotape recorder, timecode DAT player, timecode-ready MDM with a blackburst generator or any external clock source may also experience phase problems. Unfortunately, it may be more difficult being alerted to the problem in the home studio, in that smaller setups rarely have the equipment capable of displaying extensive timecode phase information. Nevertheless, the most common causes remain the same for either situation.

One of the most obvious yet overlooked steps in troubleshooting a timecode-related phase problem is to erase any timecode offsets that may have been entered at any stage of the transport chain of the machine in question, including the master synchronizer, the remote synchronizer or the machine itself. In picture mixes, to make it easier to pair a reel with its respective mix, each new reel begins with a consecutive timecode hour—that is, Reel 1 starts around 00:58:00:00, Reel 2 at 1:58:00:00, and so on. Occasionally on larger projects, a reel may start at the wrong hour for whatever reason, and hence an offset is entered to compensate. Too often, the offset is not removed at the end of the mix, however, and the next session suffers from it.

THINGS TO WATCH OUT FOR

The function in most digital audio machines that compensates for the inherent delay in digital-to-analog converters is another culprit often overlooked, although its detrimental effect is less sig-



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nificant. This parameter, commonly called "tc delay," is usually set to the type of audio output being recorded from, analog or digital. For example, digitally transferring material from a simul-DAT to a digital audio workstation for editing entails setting this parameter to "digital" on the timecode DAT player. This ensures that what one hears at a particular timecode number corresponds precisely to what was recorded during production at that time. Otherwise, you'll get a slight lag in the timecode.

Though more accessible than the previous parameter, few realize that setting the internal timecode generator of a digital audio machine to regenerate the timecode off of the tape—which seems like a perfectly valid precautionary measure—may also cause a delay. I have witnessed timecode to be out-of-phase from an external video sync signal by almost half a frame because of this. Reshaping the timecode off of the tape, a process that bypasses the internal generator altogether, works just as well (except for dropout problems) and is a much more accurate option.

It has been suggested that with balanced XLR connectors, the age-old pin 2/pin 3 hot issue can cause a 180-degree phase shift in timecode, similar to what happens in audio. This is not the case, since timecode uses a bi-phase modulation scheme in which shifts in voltage level rather than logical 1s and 0s represent bits.

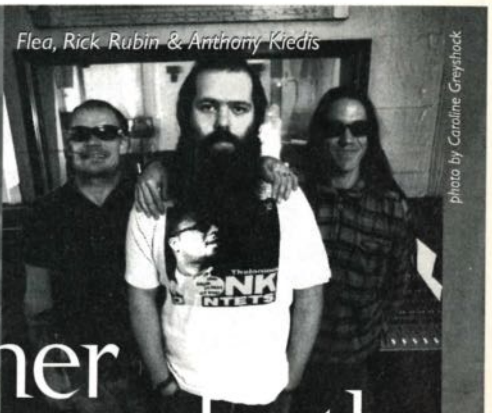
If the problems persist, check to see if the machine receiving timecode uses a user-definable "lock threshold" or a similarly named parameter that specifies the tolerance of valid lock ranges for timecode. That is, when the received timecode falls within plus or minus a particular number of subframes from the leading edge of the external video signal as determined by the "lock threshold" setting, a minuscule LED will light, indicating an acceptable "lock." Be sure that this parameter is not set at too low a value. As a reference, a properly calibrated U-matic SP player with dedicated timecode facilities should fall within +/-20 subframes or so, and top-of-the-line broadcast ¾-inch decks are usually within three subframes.

As timecode is continuously read, by the time the synchronizer finishes the sync word associated with the very end of an 80-bit timecode frame, the frame under consideration has already passed! Therefore, the synchronizer must actually internally add a frame to the value of the read timecode. I have never known a synchronizer or a digital audio machine not to do this, but older timecode readers and hot-rodded field Nagras sometimes do not have this option. Subsequently, their one-frame offsets are passed down the various stages of a film mix. If you constantly have one-frame offsets, this might be a remote possibility worth investigating.

Finally, don't be fooled by time-base correctors and built-in character generators into believing that you have a problem with the timecode on your tape. These units are notorious for delaying images, ones that might contain a burn-in of your precious working timecode.

A variation on the previous case-study is one in which timecode is out of phase by different but nondrifting amounts with every respective "play" of the transport. This occurs when the digital audio machines permit timecode output not locked to the rising edge of the external video signal. This parameter is most widely known as "synchronized playback" and is usually set as a menu item ("sync pb") or with a DIP switch.

As stated before, I've only covered issues I feel are the most beneficial in dealing with common timecode problems, focusing more on equipment functionality rather than the theoretical,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engineering aspects. But risking contradicting myself, I firmly believe that a thorough understanding of technological basics and an analytical approach to problems (the same principles and mentality that hard-core engineers use to design every piece of post-production equipment) supersedes a knowledge of "gear operationality" when a remedy is required. This article parallels answers written on the bottom of a shoe, a quick and easy solution that can cheat someone out of a more thorough and valuable comprehension. It reminds me of a saying from elementary school: "Too often we give our children answers to remember rather than problems to solve." Then again, the post-production community isn't exactly dealing with seven year-olds (or are we?). ■

Evan Chen, an editor/mixer at Soundtrack in New York City, would like to thank "the first-rate technical staff" at that facility for helping put together this article.

—FROM PAGE 157, JONATHAN ELIAS

Chip Jenkins, whose versatile magic ranges from ethnic and world music to passionate guitar; Christopher Kemp, who tackles highly inventive MTV and alternative tracks; Jimmy Haun, who Elias calls the best guitar player he's ever met, as well as a brilliant writer; and Elias, whose major focus seems to be more compositional, orchestral and ethnic work. The number of creatives, which actually totals nine including engineers, producers and such, is all to avoid one major problem: musical sameness.

"The advantage that I try to provide my clients is that by being a bigger house, I can offer them a wider array of compositional approaches," he says. "Everyone has their different specialties, which is good because if I was a one-man shop and one day someone came in and said, 'Here's an orchestral spot,' and the next day they decided they wanted an MTV modern industrial track...well, I beg to differ with many people who feel that one writer can do everything. I feel it's important that I have an array of different writers."

Apparently, he also feels it's important to have an array of different sounds, since scattered throughout the company's spacious Santa Monica offices are a wide variety of international instruments. So, let's say, for example,

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a spot calls for some Third World drumming. "What Third World?" he asks. "I might do something African in one room, somewhat Brazilian in another or something Native American in the third."

In addition to music, Elias feels that his house can better service clients because they've just brought on Daniel Hulsizer as a full-time sound designer and textural composer. The theory behind marrying composition and sound design is simple, Elias says. "When people give sound design to one person and music to another, you're often doing double work. There's two different concepts going on, and there's no consistency."

So, what's it like to have all of those creatives under one roof? Well, besides offering Elias a wide number of options to present to a client, it also spurs and fuels their output. On a typical morning, Elias will sit down with the teams and lay out various assignments for each composer, although more often than not they'll each be working on the same spot to find the right feel. "On some jobs I'm very involved musicwise, some jobs I'm just making sure the quality is good, and some days we'll all work on the same project all day," he says. "So the whole house is buzzing." After the morning meeting, the creative teams split into one of the three studios located at the Elias West headquarters.

While each studio seems to have basically the same selection of outboard gear, microphones and keyboards, each room features an independent board and tape machine. In the A Room, where Jenkins does the bulk of his work, the studio basically boils down to an SSL G Series 6000E, a Studer A827 and a Synclavier. The B Room, where you'll usually find Haun, includes an Amek Einstein and a Studer A827. Kemp's digs (aka the C Room) include a new Mackie 32•8, Tascam ATR-80 and another Studer deck. Some outboard gear highlights include a MIDI Time Piece and Video Time Piece for each room, Alesis 3630 compressors, Eventide H3000SEs, Yamaha SPX90s, Lexicon PCM 42s and Digidesign Pro Tools systems. Studios B and C also include Digital Performer and SampleCell. The company's delivery medium is DAT; Panasonic 3700s are set up all around the place.

Elias goes out of his way to mention that although they still have the Synclavier in the A Room, they are moving more toward the Macintosh world. "My feeling is that the Synclavier is the dinosaur, but it is still a useful dinosaur," he says. So, they've sprinkled Power Macs, a Centris 650 and a Quadra 950 throughout the studio. And, in the same breath that he's explaining that the Synclavier is inches away from extinction, he's exclaiming, "We don't even have a 2-track machine here. It's in storage. That's astonishing to me."

It may be that he's so surprised because as he was cutting his teeth on film trailers, he played a lot with tape manipulation. "Since there aren't really many tape machines around anymore, we really use whatever computer system we have in the room. We use a lot of collage functions," he explains. And it's obvious, because in most of the company's work, you'll find that practice. "Something that's always been interesting to me, and what I call primitive futurism, is taking organic instruments and doing interesting collage work with synthesizers."

Judging by its client list, awards and range of work (and styles), it seems that Elias' company has found the certain magic it takes to survive in the advertising world. After being around the industry for the past 18 years, he has seen a number of "shop of the days" come and go. The one thing that has kept him above the fray, he thinks, has been his ability to service people effectively on a

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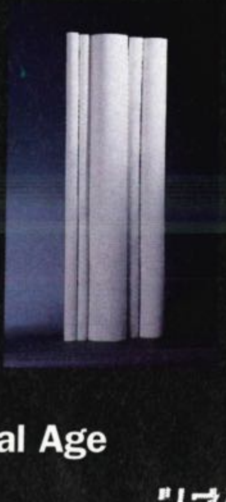

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wide variety of assignments. "It's a personality match," he says. "I've certainly been doing it long enough to build up a following and a certain amount of respect within our field, but it comes at a cost. This is very, very hard work. I love what I do. I love putting in the hours, but this business is a real challenge."

It also helps, he thinks, that he keeps a number of youngsters around to keep him going. While he admits that he isn't as young as he once was, he quickly points out, with a smile on his face, "This is a real burnout business. The longevity in the film or record world is a whole different animal than our world of advertising. I call 'em dog years." So, with 18 years, that gives him about 126 years of experience. You know what? He still looks pretty good. ■

David John Farinella is a freelance writer based in the San Francisco Bay Area.

—FROM PAGE 156, SPOTS BME

Jimmy Dolan at Streeterville installed about six soon after. Compatibility, Frankel says, was certainly an issue because he needed to archive material to bring in to final mixes.

In 1991, Spots BME moved into about 2,500 square feet, and Frankel purchased his first Avid. He also hired audio engineer Shawn Ballman away from Editel and gave him a dedicated AudioFile room, with a Sony MCI board. The business grew quickly, to the point that by 1994, soon after the purchase of North America's first Logic 3 digital console, Frankel decided to move up to 5,000 square feet in the same building he was in. And he decided to factor in a full-blown audio suite.

"Shawn was working out of a makeshift audio room that sounded good but was nothing great to look at," Frankel recalls. "I felt that the business had come to the point that we either had to do it large or quit growing. And I didn't want to quit growing. Plus, Shawn needed a well-designed room.

"So Russ Berger came up to Chicago equipped with sound level meters and walked through our raw space," he continues. "The place we were going to put our audio room he found to be potentially the noisiest area of the building. He advised putting it in another spot, and then redesigned the whole space. I had gone to another architect, but Russ asked to take a crack at it and came up with a superior design. We now have the floor-to-ceiling window between the control room and the booth—that's a Russ trademark.

"We're strictly a creative boutique, and we just happen to have what I call an online audio room, where everything else [video] is offline. This is a finishing audio room. We just take a DAT of the final mix to wherever we're posting and re-track. I consider audio part of the creative process, and I don't want to have to go around town experimenting with sound. I want it right here so I can run in and say, 'Shawn, let's work on this track and show it to the client right away.'"

"With the advent of the Avid [for picture editing], and because technology is so flexible, ideas can evolve very quickly as you experiment," Ballman adds. "And as they evolve, it's a lot easier to see the results if you can work on the

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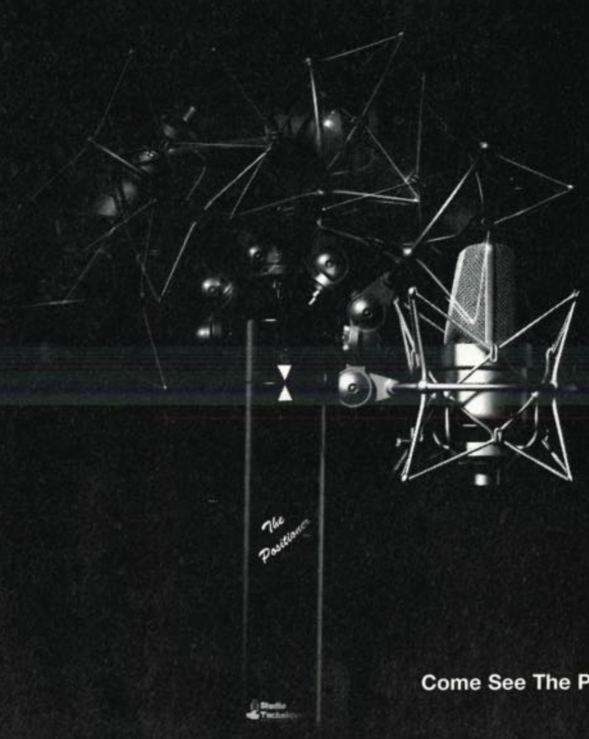

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audio simultaneously. For example, we did a TV spot for United in which a real mouse roars like a lion. That idea is easier to get across if you can do the audio while you do the video."

At the same time Spots BME bought the Logic 3, Frankel upgraded the AudioFile to a 16-channel Spectra with Exabyte backup. "We looked at a lot of different boards," Ballman says. "We didn't get the Logic 3 just because it was an AMS device and could talk digitally with the 'File. It just seemed to blow the rest away with the digital processing, onboard compression, automation. It's small physically but big virtually. It was a big step from the client's side because we had the first one in the country, and we weren't exactly sure if all the bugs had been worked out. So I had an emergency loop-through mode where the Logic would go into default and we could use our old Sony board. But we never had a problem."

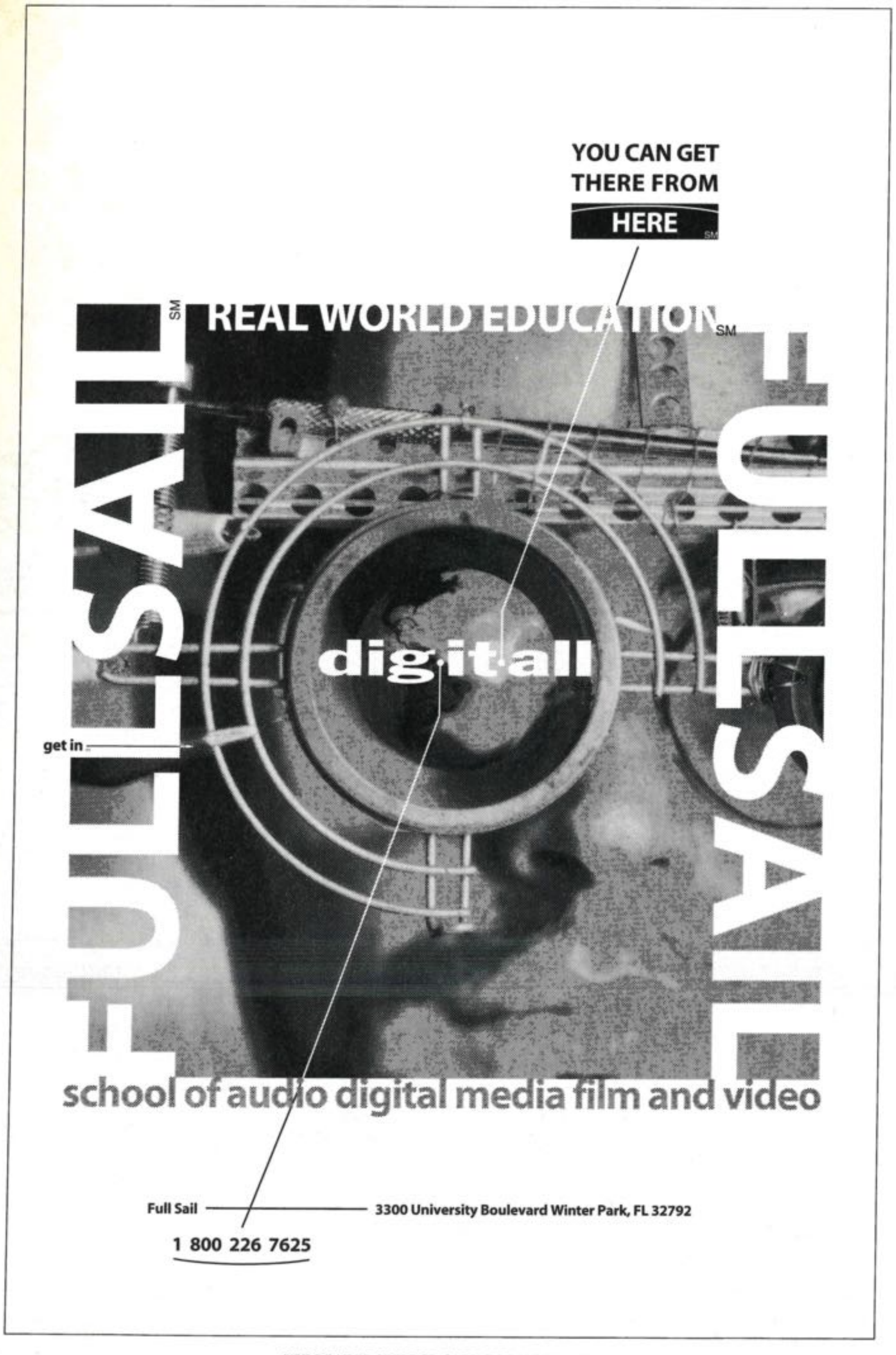
"It was also an education for our clients," Frankel interjects, "because in Chicago, people are using giant 48-channel music consoles for sweetening. Our clients are used to walking into a room with a battleship sitting there. When they came into our suite after we got the Logic 3, it was like, 'Where's your mixer?' We just convinced them that products get smaller. Computers used to fill a room; now they fit on a desktop."

Compact and powerful. Besides the Logic and Spectra, the Spots BME audio suite contains Genelec 1031A, Auratone and Yamaha NS-10 monitors, Sony 7030 timecode DAT and Fostex PD-2 portable DAT, Sony PCM-701, Otari MX-5050 ½-inch 4-track, and Denon 1200-F 200-CD changer. Outboard gear includes Eventide H3000 SE, Lexicon LXP-15, Drawmer compressors and an Aphex Expressor. Mics include Neumann U87s, Sennheiser MKH-60 P48 shotguns, AKG TLII stereo-matched and Shure SM83A lavaliers; the mic pre's are John Hardy M-1s. The facility is part of the EDNet system and can transmit audio via ISDN lines through the apt-x DRT 128 3D2 digital phone patch.

"I would say we are the only editing boutique in town with their own audio of this scale," Frankel concludes. "A lot of editors have libraries of effects, but they don't have the processing and all of the operations Shawn can do here. I would say we take 90 percent of our video clients through final post at one of the online houses in town. And we can give them finished audio. It's a major audio room, as good as anything in town.

"Five years from now, it's hard to say where we'll be. We want to remain flexible, but right now, I think we'll stay a nice, small, creative boutique and service our clients. We specialize in service. We stay until the job is done, we don't complain and we try to be very personal. If a client is in a suburb, we'll drive a tape out on a Saturday. People know we'll do whatever it takes to make the spot work. And we're always on time." ■

Tom Kenny is a Mix *associate editor.*



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—FROM PAGE 157, "ALIEN TRILOGY"

claim's Digital Production Group director, Fiona Milburn, created the sounds for the opening, level transition, win and death sequences. In addition, Buccellato tracked and edited part of the game's dialog and mixed in *Trilogy*'s music, which was composed and edited to DAT by Bobby Scumaci of Claridon Productions (Claridon, Ill.) and Steve Root, keyboardist with Mike and the Mechanics.

Buccellato started out by transferring the animated footage from a D-2 videotape to Scenaria's VisionTrack system. The animation had been shot and composed with Acclaim's Optical Motion

Capture Animation system, which was used on such recent films as *Batman Forever*. "It's filmed in a giant room that's black so they can shoot an actor going through the motions for the game," Buccellato explains. "The only thing the system picks up are the optical lights on a special suit that [the actors are] wearing. All those points are fed into a computer, which draws the corresponding images on screen. Then they put a 'skin' on it."

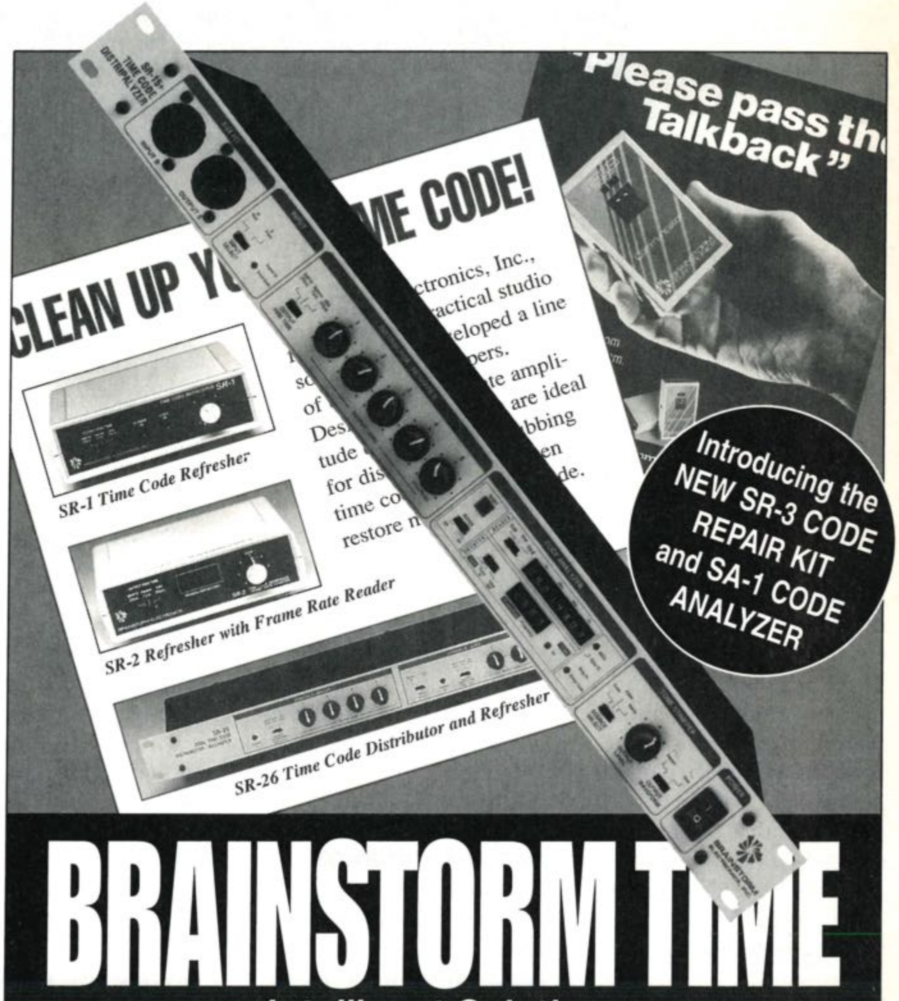
Next, Buccellato recorded dialog direct to hard disk with a Neumann U87A microphone, a Demeter VTMP-2a tube mic pre and a dbx 160 compressor, editing the mono track on ScreenSound. Once the dialog track had been completed, Buccellato, Falls and Milburn set out to compile the various "face hugging, body spearing and melting in acid" sound effects that blare throughout *Trilogy*'s sequences. "Acclaim requested that we use the effects tracks from the first two *Alien* films, which we got on DAT, but it was very difficult to find where the sounds were [on the DATs] because there was no two-pop at the head. So we matched the soundtrack on the timecoded DATs with a VHS tape of the movie to figure out where the effects were falling in regard to the action on screen," Buccellato says. "But then most of the sounds were either too short or we didn't like them, so we started with some of the [soundtrack's] sounds as a base and designed the others."

For one sequence, the sound of land rovers crunching across the terrain was not long enough, nor did it sound deep enough, so Buccellato, Falls and Milburn took recordings of other land rovers from Mixed Nuts' sound library, slowed them down to produce lower tones, and then layered them at different speeds to make them sound more full. In other sequences, they fattened up sound effects by processing the original sound on a Lexicon 300, TC Electronic M5000, Eventide Ultra-Harmonizer or Summit DCL-200 tube compressor, applying pitch-shifting, flanging and phasing effects and then layering the processed version with the original on ScreenSound. In total, they collected about 100 raw sounds between both films' soundtracks, Foley effects and their newly sculpted sounds.

One of the team's biggest challenges was matching a sound's length and movement with its accompanying action on screen. "We slowed down the swords and whips in order to match their sounds with the aliens' movements. A lot of it was trial and error, but we could tell how long it had to be so that the crescendos of the effect would match the action," Buccellato recalls.

After the sound effects had been perfected and the Foley tracks constructed, Buccellato mixed them with the accompanying dialog and music to create the final mix. "We had a total of 16 tracks recorded at mixdown, but because the Scenaria tracks are discrete, we could adjust the overall mix by tweaking individual tracks with out having to redo the entire mix." Then Buccellato transferred it back onto a D2 master with the 48kHz audio track synched to the final animated sequences. He also made a 48kHz DAT master (the Scenaria outputs audio at 48 kHz) and a 44.1kHz DAT copy. To ensure smooth sound reconstruction and mixing in case *Trilogy*'s soundtrack had to be redone, Buccellato backed up all raw effects tracks to Exabyte and all of the Scenaria's automation data on a proprietary magneto-optical disc.

Overall, Buccellato, who likened the production work to that of "several 50-second features," enjoyed working on a project that required traveling to a different type of aural universe. "It was cool because the whole project was not reality. We oftentimes have to make things sound so real, but on this project we didn't have to stay within reality's sonic boundaries." ■



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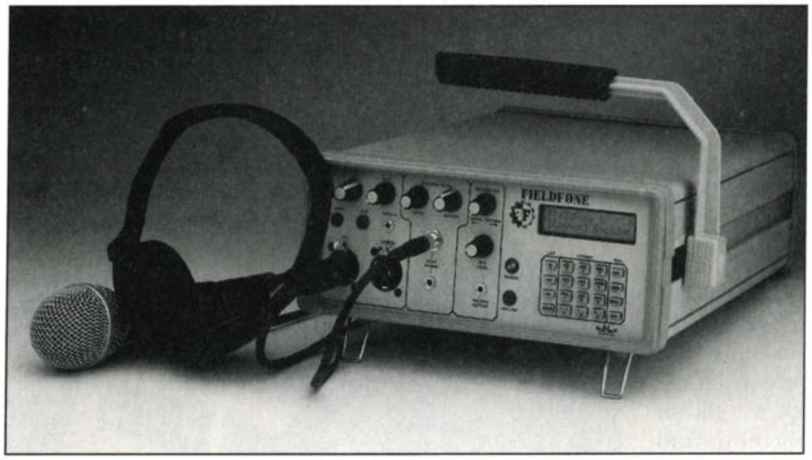

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DAWN 4 UPGRADE
Doremi Labs (Los Angeles, CA) announces Version 4 of the DAWN 4 digital audio workstation. According to the company, the system's new software and hardware boasts a six-fold increase in processing speed, reduced jitter and improved signal-to-noise. The DAWN 4's advanced auto-conform facility handles both CMX and Sony EDLs, and DAWN 4 workstations can exchange sound files over Ethernet or FDDI networks.
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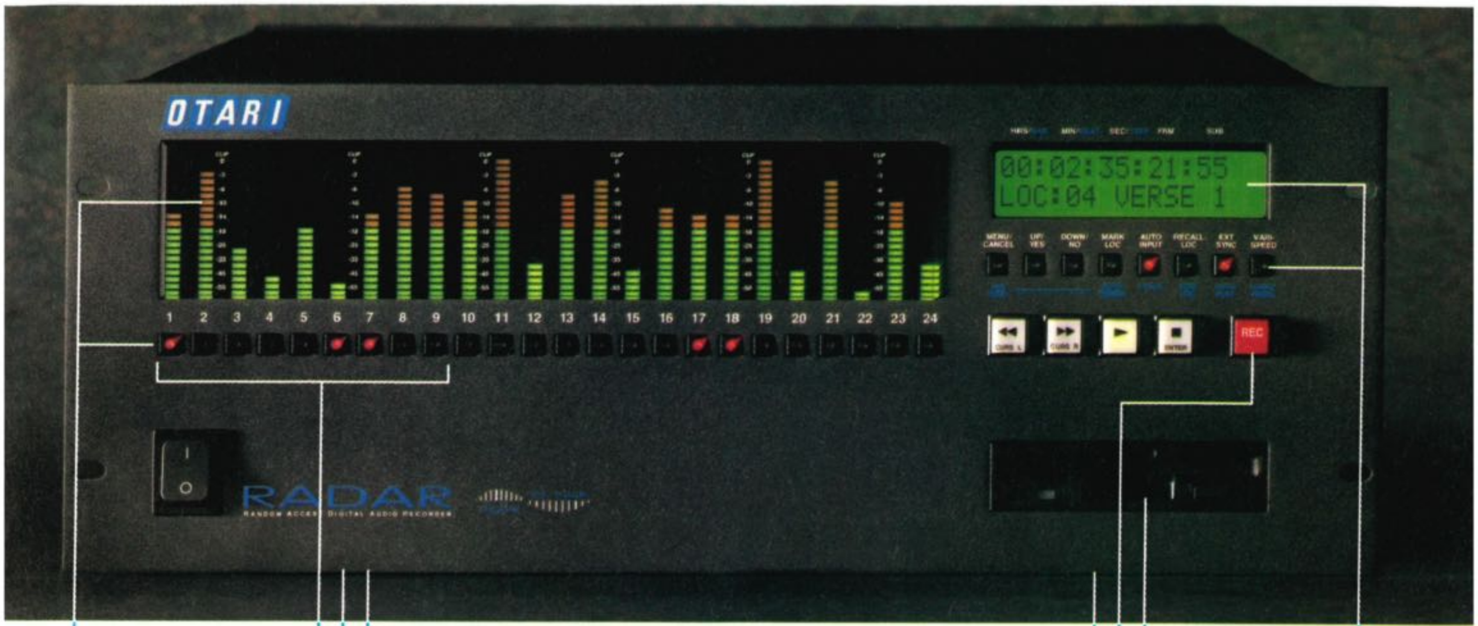

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LOUDON WAINWRIGHT III

RECORDING THE "GROWN MAN"

by Adam Beyda

In the liner notes to his 1993 live album, *Career Moves*, singer/songwriter Loudon Wainwright III reflects back on his 25-year career and characterizes the production values of his 13 previous albums as somewhat checkered. "But then I've never had much of a blast making studio records," he writes, "drinking a lot of bad coffee, furtively thumbing through back issues of *Billboard* magazine while trying to decide on a drum sound—it's just not my idea of a good time...My real job is writing songs and then performing them live for people."

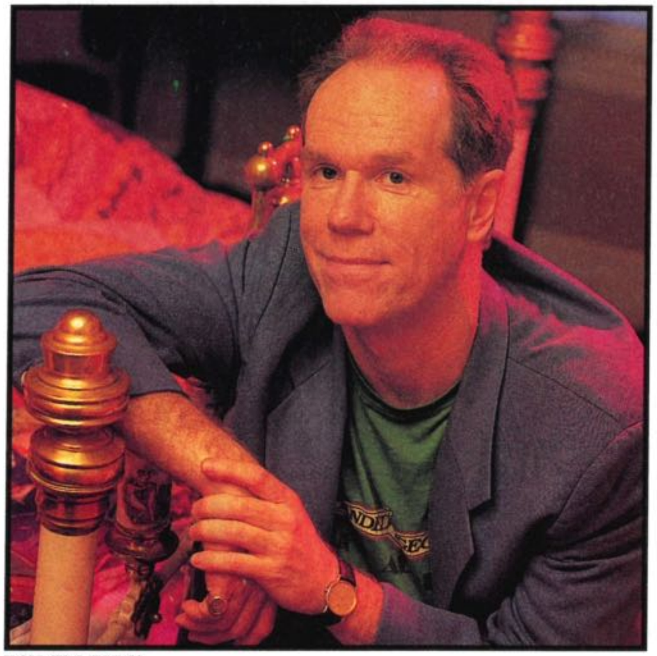


PHOTO: STEVE JENNINGS

Anyone who's had the pleasure of witnessing one of his high-spirited live shows (usually consisting of just him and his guitar) can imagine how Wainwright might have trouble in the studio. By themselves, his songs are gems of clever verbal shorthand, recounting observations and experiences in tones ranging from heart-wrenching to uproarious. But it's in his performance that the personality and life of the material really come through, via intimacies—such as phrasing and vocal inflection—that are tough to capture well in recordings.

But if he's had a rough time in the studio in the past, the fact is that by the time Wainwright wrote the above comments he had already entered his most fruitful period of studio work to date, beginning with 1992's *History*. That album was co-produced by Wainwright and producer/engineer Jeffrey Lesser (whose credits include The Chieftains' *The Long Black Veil*, Lou Reed's *New York* and projects for The Roches, David Broza, Lynn Miles and Barbra Streisand) in an ongoing collaboration that has yielded Wainwright's best recordings, including his newest release, *Grown Man*.

Grown Man is a wonderful collection of songs roughly organized around the theme of what it's like to be a still-seeking 48-year-old male. Covering an array of favorite subjects (such as family and love troubles, fear of death, domestic foibles), Wainwright glides between irony and poignancy. For the sessions, Wainwright and Lesser set out to create as intimate a presentation of the songs as possible, focusing on the vocal and the lyric. Though Wainwright performs solo in concert, most of the record features additional vocals and instrumentation, including drums, bass, a variety of guitars, harmonica, accordion and banjo. On past albums Wainwright would track live with a band, or cut his vocals to basic instrument tracks, but these approaches produced mixed results. "I would have to be singing to whatever the drummer or the bass player was doing," he says, "and I have my own inner time, from singing with the guitar."

"Loudon deals with performance-type tempo," Lesser adds, "and there's a lot of ebb and flow—if he has a lyric he wants to drive home, that line might slow down a little bit, then pick up again. He also doesn't like to lean on someone else's feel—he likes to be free-flowing with his own and then let people fit in where they can." In order to best capture his feel, they tracked Wainwright's keeper guitar and lead vocal first, then built tracks around these primary elements.

On some tracks a second guitarist or banjo player would accompany Wainwright live in the studio, but

—CONTINUED ON PAGE 212

CLASSIC TRACKS

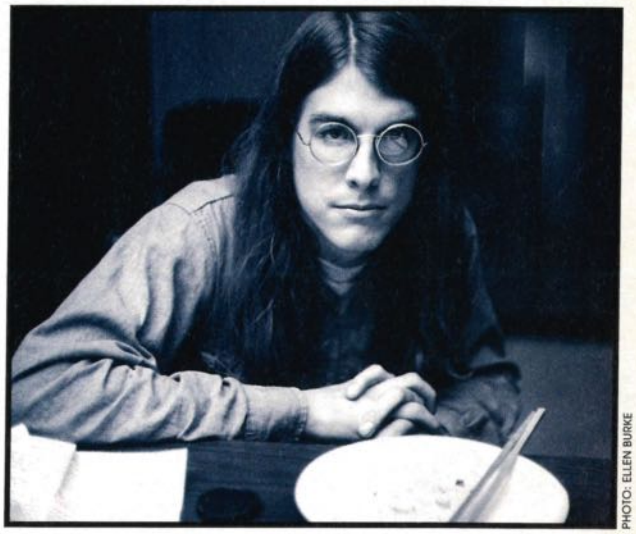
GRATEFUL DEAD: "TRUCKIN'"

by Blair Jackson

Nineteen-seventy was the year the Grateful Dead went from being a strange little psychedelic cult band with small followings in just a few cities, to a country-folk-rock phenomenon with rabid fans in *many* cities and most college campuses across the U.S., and bona fide FM radio hits. In live performance, the Dead still played plenty of their long, twisted and downright weird space jams—1970 gave us some of their finest versions of "Dark Star," for example—but beginning in the second half of 1969, they began to introduce a body of new, simpler, folk- and country-derived songs written primarily by lead guitarist Jerry Garcia and his writing partner, lyricist Robert Hunter.

The band's studio album in 1969, *Aoxomoxoa*, had turned into something of an albatross. Producing themselves for the first time (aided by their trusty technical wizards, Bob Matthews and Betty Cantor), the group spent many months and untold thousands of Warner Bros. Records' dollars to make an album that was so obtuse even most FM stations largely ignored it. (The album did contain Dead standards like "St. Stephen," "Cosmic Charlie" and "China Cat Sunflower," but the recorded versions were tame compared to the way the band played those songs live—the perennial Dead dilemma.) When Matthews and the band next went into the studio, in February 1970, they banged out their first true masterpiece, *Workingman's Dead*, in just two weeks, recording the album almost entirely live in the studio. Of course, it wasn't just the recording methodol-

—CONTINUED ON PAGE 180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Jerry Garcia, Bill Kreutzmann, Phil Lesh and Bob Weir at the Fillmore West, 1971

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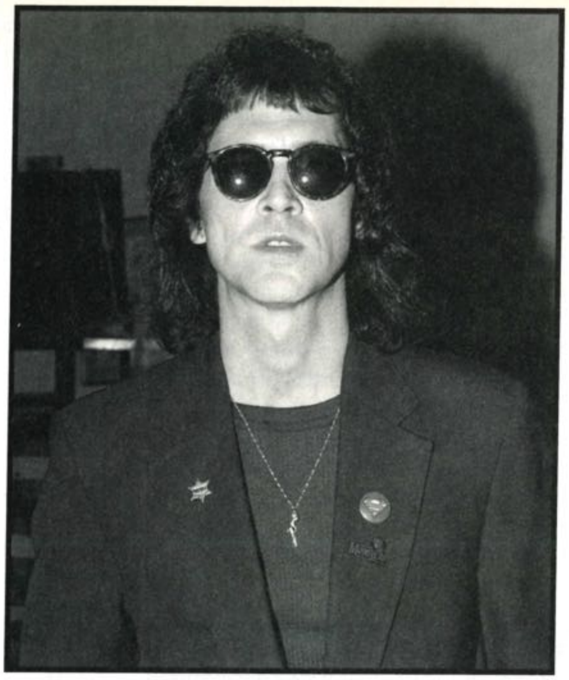

by Blair Jackson

When my promo copy of Dwight Twilley's new CD anthology, called *XXI*, arrived, I unsealed it and a little card fluttered out onto the ground. I picked it up and saw that it was a junior-sized facsimile of a page of yellow legal paper, and on this sheet was a short, hand-scrawled poem: "Roses are red/violets are blue/I'm not dead/And there's new tracks too," and it was signed "Dwight Twilley." This savvy bit of marketing gets right to the heart of the matter—the talented Tulsa native, widely respected for a series of fine pop albums in the late '70s and early '80s, had all but disappeared in the last few years. The new album, on EMI's Right Stuff label, pulls together 21 tracks from the past 21 years, from early "power pop" favorites like "I'm on Fire," "Sincerely" and "Looking for the Magic," to a pair of

—CONTINUED ON PAGE 184

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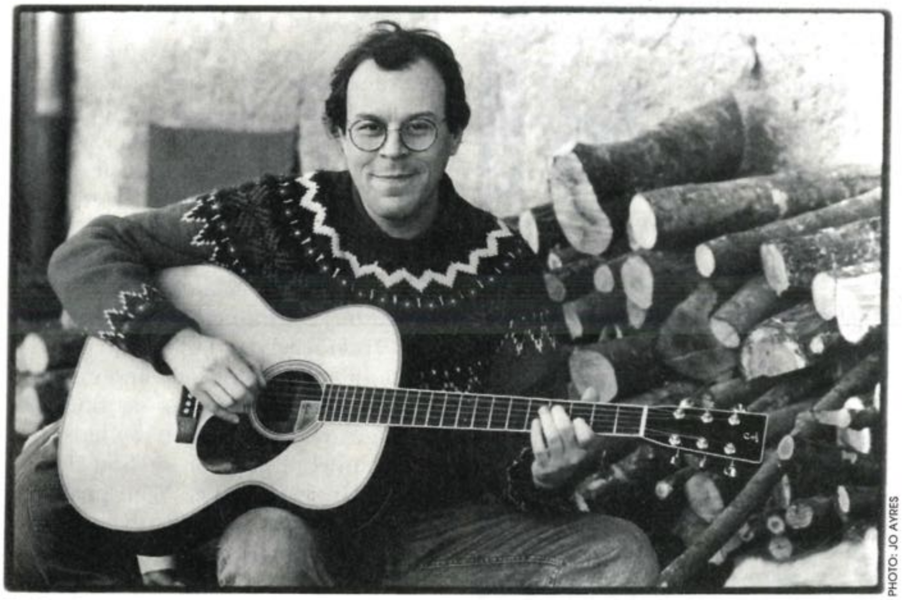
AMERICAN GUITAR MUSIC SHOWS ITS ROOTS

by Blair Jackson

As anyone who likes early blues, vintage jazz or creaky, old-timey, folk or bluegrass music can tell you, we're in the middle of the Golden Age of music reissues. The CD has proven to be a wonderful medium for preserving our priceless recorded heritage—debates about sonics aside, the CD's durability and large storage capacity have contributed to an unprecedented flood of rare, and in many cases, previously unreleased material into a market which all of a sudden seems to be hungry for every form of music, no matter how old or obscure. How can you explain the phenomenal success of the Robert Johnson *Complete Recordings* box set? Or the ten-CD *Miles Davis Quintet at*



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Stefan Grossman

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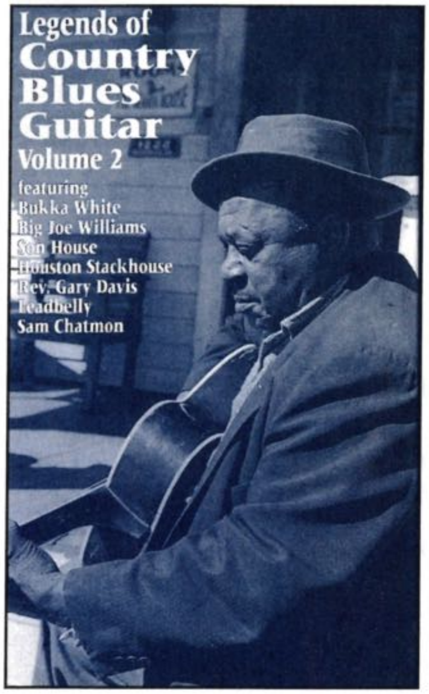
the Plugged Nickel box? Or any number of surprisingly popular releases by everyone from Bill Monroe to Bessie Smith? The answer probably lies in the integrity of the music: As a society we are constantly inundated by hype, bombast and bogus emotion manufactured by smooth marketeers, so when we hear music that has real humanity to it—and *every* genre of America's roots music has that in spades—it elevates and nourishes us, because it's *soul* music in its purest form.

This is turning out to be the Golden Age of roots music videos, too—not surprising considering the ubiquity of VCRs (and to a much lesser degree, laserdisc players). While there obviously isn't nearly as much old film material to draw from as audio sources, there is still a wealth of great footage out there, especially from the late '50s and '60s, much of it still in private collections. For the past few years, Vestapol Videos, a division of Stefan Grossman's Guitar Workshop, has been perhaps the most important source of roots music videos in this country. Grossman, a picker and teacher for more than three decades, has managed to unearth an incredible variety of music footage from dozens of different sources, and compiled them into a series of videos distributed by the roots-conscious Shanachie Records label. (Incidentally, "Vestapol" is an 1840s parlor-guitar composition that found its way into the repertoires of numerous folk and blues players through the years.)

Among the titles already in the ever-expanding Vestapol catalog are *Legends of Flatpicking Guitar*, which features performances by Doc Watson, Tony Rice, Norman Blake and others; two volumes of *Legends of Country Blues Guitar*, with footage of Big Bill Broonzy, Bukka White, Reverend Gary Davis, Son House, Leadbelly, Mississippi John Hurt and more; *Legends of Bottleneck Blues Guitar* (Son House, Fred McDowell, Jesse Fuller, etc.); two volumes of *Legends of Jazz Guitar*, with clips of Wes Montgomery, Joe Pass, Kenny Burrell and others; three different Doc Watson collections; three Freddie King anthologies; hour-long videos featuring Merle Travis, Lightnin' Hopkins, Elizabeth Cotten, Mike Seeger; solo fingerstyle guitar music from Africa; and several others. New and forthcoming releases include a John Lee Hooker collection, *Legends of the Delta Blues*, *That's Slack-Key Guitar*, *Texas Blues Guitar*, *The Films of Pete and Toshi Seeger* and many more.



"I think it's historically important to do the Vestapol videos—to find the footage and put it out so my kids can see John Hurt play, or see Son House play," Grossman says. "The problem with videos has been that the distribution is problematic because shops don't know where to put them. Our hope is that when the 5-inch laserdisc gets ac-

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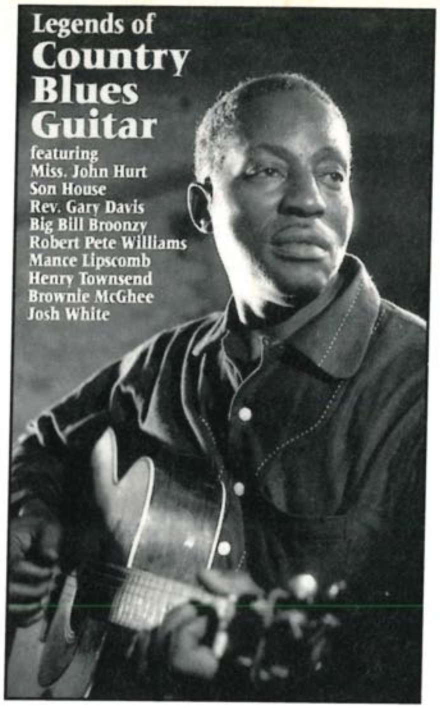

cepted and becomes widespread, the distribution will improve and stores will buy them because they'll have the rackspaces available. Plus, the quality will be better. VHS is a pain in the ass, though of course I'm happy with what we've put out on tape so far."

Grossman has searched high and low for film sources, frequently digging into the vaults of European TV stations to mine his gold. The BBC has, not surprisingly, been a good source, though Grossman says, "Unfortunately, a lot of BBC material was simply thrown out over the years." In the U.S., sources range from folk great Pete Seeger's private collection to archives at various colleges and universities.

"I'd heard that in the '50s, Pete Seeger was going around filming things, so I went over to his house, and he was so gracious," Grossman continues. "He said, 'Go on up to the attic and take whatever you want!' So there I was going through these cans of film with a half-inch of dust on them. But I found footage of Sonny Terry from 1957, Big Bill Broonzy from 1957—incredible stuff. Then there's all the stuff that [ethnomusicologist] Alan Lomax had—the 1966 Newport Folk Festival with Howlin' Wolf, Skip James and all this other great material. There was footage from the University of Washington, a one-camera shoot that their anthropology department did [of a folk/blues festival there]. And I thought, 'This is weird, they have one cut by Son House of seven minutes, but I know the Bolex camera had 20 minutes of film. There's no way they

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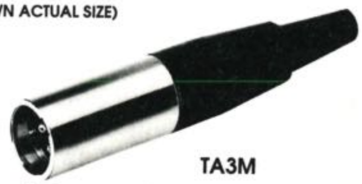

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would have only shot seven minutes.' It took me two years, and you always have to have the help of some archivist, and I had a very nice woman helping me there, and lo and behold, in the corner of some obscure archival room, she found boxes with all the other material—the rest of Son House, the rest of Johnny Shines, Bukka White, Mance Lipsomb. So what we do is, since they don't have the money to convert it and put it together, we do that and we license it with them and get contracts with all the estates of the artists."

The technical quality of the material varies since the sources range from professional shoots to home-movie Super-8. "If the visual quality is a little rough, sometimes the Japanese prefer it because they think it looks rarer," Grossman says with a laugh, adding, "but generally the quality has been pretty good." Grossman says the audio, too, has been a mixed bag, and occasionally required a bit of sonic work.

"On the footage of Mance Lipsomb from the University of Washington, for example, we had A-B reels. One was the visual, and one reel was the sound, and it's optical sound that was taken off the reel-to-reel Nagra tape machine. But the optical sound had a flutter on it. So I got the Nagra reel-to-reel, which is obviously better quality, but because 28 years had elapsed, the tape had shrunk a little bit. Now with film you're going to have 30 frames per second, so the actual tape on the Nagra had shrunk so it was out of sync by five frames. That's not much, but it's enough for you to see it, and by the end of three minutes it's off by something like two seconds. So that had to go into the studio and on to the computer [a Sonic Solutions Sonic System] and sampled so it sat right." Rare color footage of Leadbelly lip-synching three tunes in the '30s and '40s [on *Legends of Country Blues Guitar, Volume 2*] was painstakingly hand-synched by Pete Seeger in the mid-'60s using a tape and a Moviola. Those are two of the most extreme examples in the Vestapol catalog; most footage has come to Grossman in more workable shape.

Grossman does much of his video mastering work at a Manhattan online videotape editing facility called Tapestry Productions. According to Tapestry's John Sniado, "Some of the stuff originated on 16mm, which has the old optical soundtrack and a rather limited frequency range. When it's transferred over to Betacam or D2, there's not much we can do with the EQ on those types of tapes. There are other tapes that come from every format you can imagine. We have kinescopes—the original kinnies were recorded onto 16mm film because they didn't have videotape recorders most places. So at some point they might transfer it over to 2-inch, so we have to find an old 2-inch machine that would play the tapes and then transfer to a more modern videotape stock.

"The BBC tends to keep their archive stuff better than anything in the United States," Sniado continues. "The audio quality on their kinnies, as well as their 2-inches and their 1-inch tapes, is better than most things over here." When he can, Sniado uses EQ to eliminate hums, and "if I get stuff that's swinging all over the dial, I'll run it through a compressor. I use this little Alesis 3630 compressor I've had for a few years, and it serves its purpose. But I use my ears more than anything."

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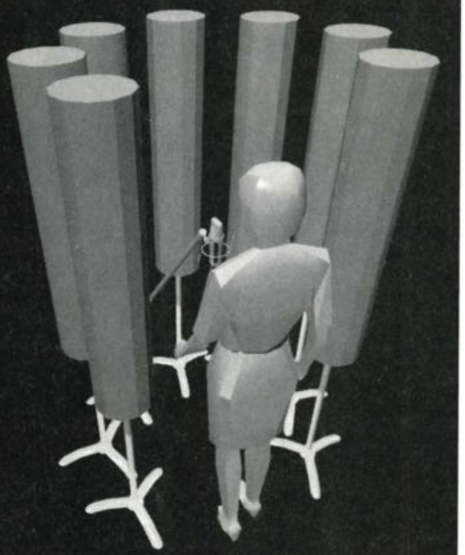

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In a world where selling 5,000 copies of a video is considered great, Grossman is enthusiastically serving numerous niche markets for only a limited financial return. But sales have risen steadily for the format in general, and as he noted earlier, the advent of the 5-inch digital video disc could change the terrain of the business considerably. "What I'm into, and always have been," he says, "is information. I've been touring and performing since '67, but I've always done the [guitar instruction] books. Now I've got the video thing happening, and that's another aspect of the same thing, in a way. The more you can learn the better, and the more information you can give people, the more they can build worthwhile opinions on. That's what I'm trying to do." ■

—FROM PAGE 173, THE GRATEFUL DEAD

ogy that made that album work; it was the songs—"Uncle John's Band," "Cumberland Blues," "Black Peter" and even "Casey Jones" found the Hunter-Garcia team mining a rich vein of Americana in their songwriting. "I'll tell you what affected me," Hunter told me when I interviewed him and Garcia together a few years ago. "I was so impressed by the songwriting of Robbie Robertson [of The Band], I just said, 'Oh yeah, this is the direction. This is the way for us, with all our folk roots, our country and bluegrass roots.'"

It was an amazingly prolific period for Hunter and Garcia, who were living together in a redwood-shaded house in southern Marin County. "It was the basic thing of friendship, economics and all that stuff," Garcia said in the same interview. "We had a nice big house that we could afford to live in together but probably couldn't have afforded separately at that point." Hunter added, "I'd be sitting upstairs banging on my typewriter, picking up my guitar, singin' something, then going back to the typewriter. Jerry would be downstairs practicing guitar, working things out. You could hear fine through the floors there, and by the time I'd come down with a sheet and slap it down in front of him, Jerry already knew how [the tune] should go!"

Writing the song "Truckin'" was slightly more complicated than the scenario above, as it also involved two other writers besides Garcia and Hunter. Rhythm guitarist Bob Weir and bassist Phil Lesh also had a hand in the song's musical construction, and ultimately it was Weir who became the lead singer on it. It's one of the few Dead tunes with overtly autobiographical overtones—though most of the lyrics paint a playfully oblique portrait of the band on the road, one verse refers specifically to the Dead being busted in New Orleans in January of 1970. The bridge of the song closes with what has become Hunter's most quoted line: "Sometimes the light's all shining on me/Other times I can barely see/Lately it occurs to me/What a long, strange trip it's been." That was true enough when the band had only been together for five years; it had even more resonance when the group hit the 30-year mark in 1995.

The Dead were on such a songwriting tear in 1970 that they returned to the studio just three months after *Workingman's Dead* was released in May. Matthews and Cantor were busy on another project when the recording bug bit, so the Dead turned to a relative newcomer on the San Franciso recording scene—an engineer at Wally Heider Recording in San Francisco named Steve Barncard—to cut the tracks, coproduce and mix the album that would become *American Beauty*, arguably the group's most beloved work. A native of Kansas City, where he played in several popular local bands and worked as a radio DJ, Barncard moved to San Francisco on a whim in mid-1969. His first day there, Barncard walked into Heider's, where the Jefferson Airplane had just finished their *Volunteers* album, looking for a job. He was *not* hired on the spot, but Barncard was sufficiently inspired by what he saw to write a long letter to Heider, pitching his skills. In the meantime, he moved to L.A. and took a job wiring speakers and assisting at the Village Recorder. Two months later, Barncard got a call from Heider (whom he describes as "probably the greatest big band engineer of all time") and an offer to work as assistant engineer at his San Francisco facility. "They needed someone to assist [engineer] Bill Halverson on Crosby, Stills & Nash's album. This doesn't happen anymore," Barncard says. "In those days, people weren't asking for these jobs. There weren't all these recording school graduates running around; it was wide open. And the pay was great for that time—$10 an hour, which is more than some assistants get today. Before that, I'd been lucky to get a radio job that paid me $400 a month, and this was like $400 a week."

> **"Truckin'" is one of the few Dead tunes with overtly autobiographical overtones.**

At that time, Studios A and D were still under construction, and most of the great work was being done in Studio C, which was equipped with a custom Frank De Medio console. "He needs to be remembered because he brought a lot of quality to Wally's studios," Barncard says. "He used only these massive Switchcraft pushbuttons and telephone-type lever switches and big relays and plug-in amplifiers. It was really an incredibly well-built and simple thing: 24 channels, 8-bus. The path was extreme-

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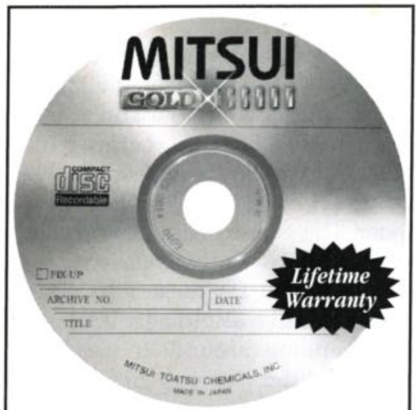
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ly simple. He would have one amplifier in the chain—this plug-in line amplifier made by UREI—and they would set up the gain in it so it was always set to high, and then for anything coming into it they would use resistant pads. People frown on this sort of stuff today. Everything was tranformer-balanced. No op amps. All transformer-isolated. And the EQ modules were just passive UREI EQs on the way to the line amplifier. What they did is switch between line and mic. They just put in more fixed pads for line, so you're always dealing with the same amplifier, and there was no feedback loop. Everything was calibrated with those losses in mind, and you just switched them in and out. So it was extremely reliable. They had these Gotham faders, which at the time had 2 dB per step, so they were a little clunky to work with—they worked on a dial cord that actually turned a pot inside, but it was a step above rotary pots. At the time, it was very high-tech."

Jerry Garcia at Wally Heider's, 1971

PHOTO: STEVE BARNCARD

Though Studio C was only modestly sized, with what Barncard terms a "tiny" control room, "That room was Ground zero for so many great records," he notes. "It was the simplicity of the room that made me work with mic placement rather than worry about the kind of mics I was using. I didn't have a big selection; I didn't have a lot of European condensers. But they had a lot of [Neumann] 67s, a few 87s, which I still hate to this day—I can't use them; they're too harsh. They also had a lot of C-37s. My favorite condenser for acoustic guitars was probably the [AKG] C-60, a lipstick tube condenser. The actual capsule was similar to the 451. We had four or five of those. I'd usually use 67s on overheads. For vocals I'd use just about anything. I used the [Shure] 547. The 56, 57 and 547s were staples of the remote industry, which may explain why Wally liked them.

"The monitor system was pretty crude, pretty bad," Barncard continues. "[Studio C] had Altec 604s that were in a cabinet that was designed not for its acoustic properties but because you could make it out of a single sheet of plywood. My big complaint about '70s recording is that there was no standard to monitoring whatsoever, or if there was one, it changed all the time."

More to Barncard's liking were the studio's echo chambers, which he used to greatest effect on David Crosby's breathtakingly beautiful 1971 solo album, *If I Could Only Remember My Name*. Though the studio had one of the earliest Ampex MM1000 16-tracks, "I liked to work on the 3M 16-tracks. I liked them much better, and I used Scotch tape exclusively. Everything I ever recorded on 3M tape is still playable today and sounds great. Every piece of Ampex tape I used in the '70s turned into glue and stops the tape."

Barncard made the transition from being an assistant to a first engineer during the sessions for Crosby, Stills, Nash & Young's *Deja Vu* album, but to land the Dead's project, he had to, in essence, audition for the job: "Phil [Lesh] wanted a good bass sound, and that was going to make the difference," Barncard explains. "My boss said, 'Get a good bass sound, Steve, and we've got the Grateful Dead.' Well, Phil was using two amps—he was using the exact same rig as [Jefferson Airplane bassist] Jack Casady, and I was familiar with Jack's rig. He had a big amp for the low end and the thud, and then a little amp for the buzz that's in the middle. So between those three inputs [two amps and a DI], I was able to make a bass track that worked for him. We did it in Studio A," which was equipped with a Quad 8 24-input, 8-bus console.

Like the sessions for *Workingman's Dead*, work on *American Beauty* went quickly and easily, Barncard says. "It's a very live record, and it was really fun all the way through. I had heard bad stories about engineers' interactions with

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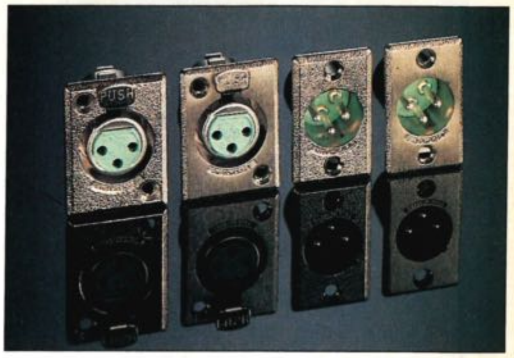

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the Dead and about how they always had a thousand people in the control room and hippies camping out in the studio and massive acid parties. What I found were a bunch of hard-working guys, a great, tight band who had woodshedded everything, who knew exactly what they wanted to lay down and where they wanted to go with it. The vocals were all ready. There was not a whole lot of experimentation. They had sat around in a circle and rehearsed this record, so they were ready to go when I got them. Some records sort of assemble themselves. You do a take and everybody says, 'Yeah, that's it. Let's move on.' And everything falls into place."

Typically, the basic track would consist only of Garcia, Weir, Lesh and drummer Bill Kreutzmann. Though Mickey Hart was still drumming for the band live, his involvement in the album was minimal—mainly for percussion overdubs. And Ron "Pigpen" McKernan, who played B-3 for the group in concert, didn't play on the album at all—instead, organist Howard Wales and pianist Commander Cody added the needed keyboard textures. On "Truckin'," which was cut in a day in Studio C, the 16 tracks broke down this way: Track 1—Garcia's electric guitar; 2—piano; 3—kick drum; 4-5— more drums; 6—snare; 7—organ; 8—bass amps; 9—bass direct; 10—Weir's lead vocal; 11—Garcia's acoustic guitar; 12—Weir's acoustic guitar; 13—Weir's electric guitar; 14—Lesh's backup vocals; 15—Weir's backup vocals; 16—Garcia's backup vocals.

The Dead were a notoriusly weak vocal band in the late '60s, but by 1970, the combination of hours of harmony singing practice and the influence of their friends David Crosby and Stephen Stills made it possible for the Dead to put out an album that was filled with glistening harmonies. I had assumed that this area must have taken a tremendous amount of time in the studio, but Barncard says, "I was skeptical going in, but they were brilliant. They walked in and just did it. People don't believe me when I say this," he notes with a laugh. For the harmony parts, "I used three 67s [for Garcia, Lesh and Weir], ran each one through a separate limiter and then doubled it" to make it sound fuller.

American Beauty was a largely acoustic guitar-based album, so it's not too surprising that the first live versions the band played of "Truckin'" came during the acoustic sets they frequently performed in the summer of '70. It wasn't until October of that year that the song made its transition to an electric number, and it would be another year before it really began to blossom and become a jumping-off point for exploratory jamming around that distinctive shuffle beat. "Truckin'" was an instant hit on FM radio in the fall of '70, and nearly a year later an edited single version made it to Number 68 on the *Billboard* charts. The album version has been the fodder of "classic rock" stations ever since. The Grateful Dead never played a version of the song even remotely like the one on *American Beauty* once the record came out—as was their wont, they were more interested in taking the song someplace it had never been before.

A post-script for Deadheads and other interested parties: Keep an eye out for an extraordinary one-hour documentary about the making of *American Beauty* and the 1968 Dead album *Anthem of the Sun*, directed by British filmmaker Jeremy Marr and set to debut on PBS television this summer. I was fortunate enough to see a nearly finished version in early March and was blown away. It features never-before-seen historic footage of the Dead in the studio and onstage, current interviews with Weir, Lesh, Hunter and Barncard talking about working on those records, and archival interview footage of Garcia, GD sound ace Dan Healy and others. It's an illuminating and ultimately touching look at the some of the Dead's high times. And you recording freaks will be fascinated by the techie aspects of the production. ■

—FROM PAGE 175, DWIGHT TWILLEY

new songs, the most recent cut in October of '95. The album is a potent reminder of Twilley's knack for writing bright melodies and strong, hook-filled arrangements. The only disappointment for me is that the single-CD format leaves off so many favorites from this always underrated songwriter.

In the mid-'70s, Twilley and his partner, drummer-singer Phil Seymour, were a couple of young Tulsa rockers deeply into Elvis and The Beatles, at a time when the first glimmers of what would become known as the "new wave" movement were appearing in big cities across the U.S. That sobriquet would eventually encompass everything from The Clash and Elvis Costello to more straight-ahead rock-

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ers like Twilley and Tom Petty & the Heartbreakers. "Dwight always hung around with intellectual types—artists and actors," Phil Seymour said in an interview years ago. "We went to an upper-middle-class high school, and Dwight was always regarded as a crazy artist."

"Tulsa was all Leon-ed out," Twilley told me when I first interviewed him in 1979, referring to Tulsa native Leon Russell. "It's a small, rich town, and it was hard for the wild young guys to get much happening. I was really on the outside of the music scene, so I spent my time getting ready to make records."

When we spoke again this past January, Twilley elaborated: "Where Phil and I came from was the notion of being 'recording artists.' We weren't a band that went around and made a name for ourselves being a band. There wasn't much work around Tulsa anyway. A small clique of musicians there got all the best gigs. So we'd go out of town and play terrible fraternity and sorority parties and jock-type clubs, playing Elvis and Beatles songs five times as fast as the original tempos. We'd mix in one or two original songs and nobody would really notice. But our main concentration was always recording. And it takes a lot to make good record on a 4-track, which is what we had. That's a skill in itself, and it gives you some discipline. I know a lot of people came up in 24-track, but we spent a lot of serious time with a 4-track, so when it came time and we had a lot of tracks in front of us, it wasn't like we just swam through them. We already had a sense of what to do and what not to do."

In 1974, Twilley and Seymour traveled to L.A. with one of their 4-track demo tapes, which eventually wound up on the desk of producer Denny Cordell, ironically enough, president of Leon Russell's Shelter Records label.

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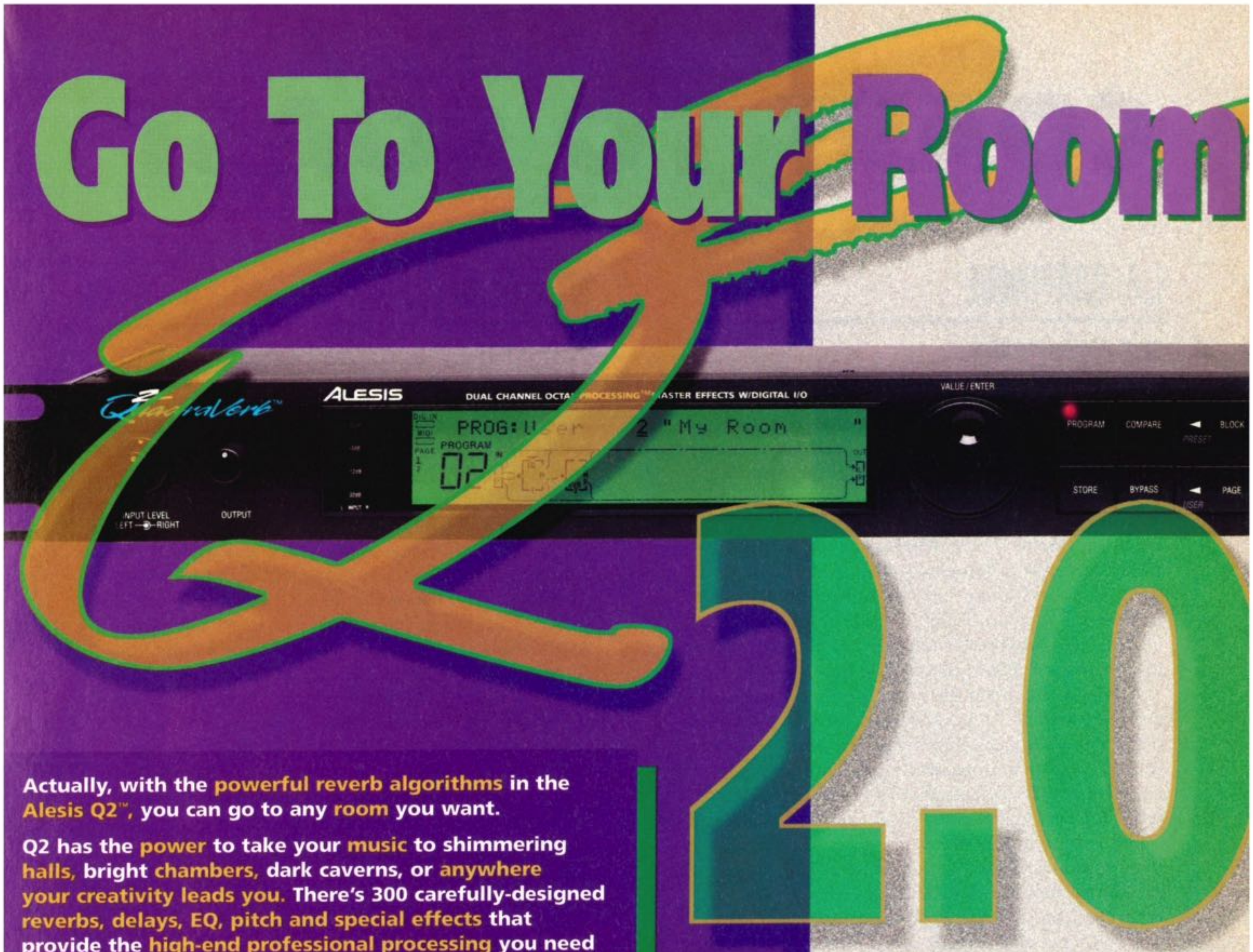
>
> ***—Dwight Twilley***

Cordell agreed to let the duo produce their own debut album—they used the pseudonym "Oister" as their producer's moniker—but he sent them back to Tulsa to record at Russell's studio. "*Sincerely* [the first Twilley album] was cut all over the place—some in L.A., some in Tulsa, some in England, in a number of different studio situations," Twilley says. "Probably the most interesting thing was, since we had just gotten signed, we came directly from our little 4-track shop that was above [guitarist] Bill Pitcock's grandfather's electric company—it had a TEAC 4-track and mixing through a Shure P.A. head. Within a six-month period, we found ourselves at Leon Russell's home studio with a 40-track Stephens, so that was a pretty big culture shock. Everything in the room was new, and it had a great sound to it. It was pretty exciting for a couple of young guys starting out." That album was engineered by Twilley's in-house tech Jim Barth, Bob Schaper, Roger Harris and Roger Linn (pre-LinnDrum!).

Twilley's first single, "I'm on Fire," was an instant sensation, but unfortu-

—CONTINUED ON PAGE 211

Go To Your Room



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COAST TO COAST

L.A. GRAPEVINE

by Maureen Droney

Could be a trend on, and I like it. More juice for sound people! First, **Coolio thanked Skip Saylor Recording** (Yes! How often do Grammy-winning artists give a nod to the facility and engineers that work so hard to make them realize their art?) as he accepted his Grammy for Best Solo Rap Performance. Right on, Coolio. Then, **Warner Bros. Studios Facilities** threw a tasteful bash on the Burbank lot to honor a sound team that has been honored four years in a row with Academy Award nominations.

The team (nominated this year for *Batman Forever*) consists of dialog mixer Donald O. "Papa-san" Mitchell, music mixer Michael "Mikey" Herbick, effects mixer Frank A. Montano and production sound mixer Petur Hliddal, all nominated for Best Achievement in Sound; and supervising sound editors John Leveque and Bruce Stambler of SoundStorm, nominated for Best Achievement in Sound Effects Editing. These five principals represent more than 30 people (from producer Peter McGregor-Scott and president of Warner Bros. Studio Facilities Gary Credle to the dialog editors and the Foley artists and engineers) who've worked together in an alliance between SoundStorm and Warner Hollywood. The collabora-

—*CONTINUED ON PAGE 192*

Pictured on the Warner Bros. Burbank lot are (standing, L to R) Doug Greenfield, Peter McGregor-Scott, Donald O. Mitchell and Frank A. Montano. Seated are John Leveque, Michael Herbick, Ray Dolby, Bruce Stambler and Curt Behlmer.

PHOTO: BERLINER STUDIO

NY METRO REPORT

by Dan Daley

Power Station lost its last bid at fending off foreclosure from a lender suit by Chemical Bank and was scheduled to be sold at auction on April 25, 1996, ending an era in New York recording studio history. The entire contents of the facility as well as the six-story building itself were slated to go on the block. What remained unclear at press time was whether the studio would be sold as a single entity or piecemeal. There was speculation that either a coalition of independent studios in New York or a large, corporate-owned studio would bid on the entire facility and building. Prior to the announcement of the sale, I spoke with several studio owners off the record, to get an idea of what a closing of Power Station would mean to the New York Studio community. In retrospect, their responses remain valid, even as the last chapter in this unfortunate saga unfolded.

Some were annoyed that it got this far at all: "The whole thing is bullshit," one source said. "On one hand, as a facility owner, it's upsetting to see this happen—getting yourself into this kind of mess after so many years in business. On the other hand, I see a lot of mistakes made that haven't been admitted to. There's three things that could happen as a result of this: My business could get better, my business could stay the same, or I could lose business. Why? If Power Station goes out of business, maybe I could raise my rates or some of their clients will work here. I doubt that will happen. It could stay the same, like it did after Skyline went under. Or, if people perceive New York as having one less great facility, it could cause fewer [recording clients] to come to New York at all. And that's going to hurt us all."

On the other hand, some believe that Power Station's problems are irrelevant to the rest of the community. "It's a huge mountain made out of a molehill," another source said. "Nothing that happens there will affect the other studios. Power Station may change ownership. But there's no real implications here, except that maybe Tony Bongiovi won't be in the studio business anymore."

Many are simply perplexed at how the studio found itself in this situation to begin with: "I find it hard to understand how a bank can get that much control over your business, supposedly telling you who you can do business with. I find what I'm hearing hard to believe. Power Station and [new joint venture partner] Media Muse are private companies, so there's little you can know

—*CONTINUED ON PAGE 196*

SESSIONS & STUDIO NEWS

NORTH CENTRAL

Producer **Mr. Colson** was at **Smart Studios** (Madison, WI) doing mixes and overdubs for MCA Canada artists **The Watchmen**...**Veruca Salt** were in tracking with producer/engineer **Doug McBride** at **Gravity Studios** (Chicago). McBride also worked with **Stick Figure**, featuring members of The Smithereens, the Del Lords and the Cleveland Indians—pitcher Jack McDowell is a bandmember...Recent sessions at **Chicago Trax Recording** included **Tranquility Bass** tracking a self-produced effort with engineers **Tom Carlisle** and **Critter**. **Ministry** were also in, as were **Liz Phair** and **Jim Ellison**, who recorded a song for the *Stealing Beauty* soundtrack...Reprise faves **Wilco** recorded their highly anticipated sophomore release at **The Chicago Recording Company** with engineer **Chris Shepard** and mixer **Richard Dodd**. The indomitable **Jesus Lizard** were also in recording their Capitol debut with producer **GGGarth Richardson**...**Elephant Music Productions** (Wichita, KS) recorded the **Wichita Jazz Orchestra** live-to-2-track at a recent show. Bandleader **Steve Slater** produced, **Christopher Neal** engineered and **Dave Liljestrand** was

—CONTINUED ON PAGE 196

PHOTO: NATE WEAVER

Studio A at Echo Park Studios in Bloomington, Ind., features an API 32x16x32 and an Otari MX-80 24-track. Recent sessions have included Robert Mirabal for Warner Western with producer Mike Wanchic and engineer Mark Hood; Lisa Germano for 4AD with producer/engineer Paul Mahern; and Over the Rhine for IRS with producer/engineer Pat Moran.

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PHOTO: JOSHUA HOLLAND

Owners Joshua Holland (L) and Taylor Burr size up the Amek Angela 36x24 at their Burr Holland Recording Studio in Minneapolis. The studio, known for its huge knobs, also features 24 tracks of ADAT with BRC and a Tascam MS-16 1-inch. Sessions have included Soul Asylum's Dave Pirner collaborating with Brenda Kahn on a project engineered by Ezra Gold; Romee Ulven (produced and engineered by Holland); Bolivian combo Sentimento Andino (produced and engineered by Burr); and Casino Royale with Phull Syrkle (produced and engineered by Chuck Zwicky). Staffer Tommy Roberts has engineered projects with Pirner and Ed Ackerson, as well as produced Fauna.

STUDIO SPOTLIGHT

Mix doesn't often feature people like Randy DeFord of Monticello, Ind. He has no 72-in console, no 24-track, no hit records. He's a guitar player, with emphasis on steel, and he is representative of that huge segment of the recording market that aspires to the big-time. DeFord, who works as a spring design engineer during the day, is currently running the fifth incarnation of his project studio.

As a young guitar player in 1975, DeFord hooked up with Roger Hill of Kokomo and was bitten by the recording bug. Hill, an electronics buff, built him a Groms-style 8-in tube mixer ("just gain") and a Telefunken-style plate reverb. Later, he bought a Tapco console, then a Tangent, and spent most of his recording days on 45s and demos. "Back in the '70s," he says, "there seemed to be all kinds of demo contests—'Enter your band and win a trip to Zanzibar.'" Today, he has a Mackie 1604, and many of the sounds for this sometimes one-man-band come from an E-mu Proteus Plus MPS. Sequencing takes place in Power Tracks Pro, and he recently purchased a Vestax 6-channel hard disk recorder with a 1GB drive.

PHOTO: CHUCK DEFORD

DeFord has learned recording mainly through 20 years of trial and error, and his demos have been solid enough to be profiled in the February 1995 issue of *Guitar Player*. In the past year, he put together five

—CONTINUED ON PAGE 198

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NASHVILLE SKYLINE

by Dan Daley

On February 22, the **Nashville Association of Professional Recording Studios (NAPRS) held its first annual meeting,** which took place in the conference room of the ASCAP building at the top of Music Row. Castle Studios owner Jozef Nuyens was elected president of the organization; others elected included Sixteenth Avenue Studios manager Preston Sullivan as chairman of the 14-member board of directors; Jennifer Rose of Midtown Tone & Volume as vice president; Marty Craighead of Javelina as secretary; Sound Stage manager Michael Koreiba and Barry Saunders as co-treasurers; and Sound Kitchen owner Dino Elefante as sergeant-at-arms. Several committees were formed, including a technical committee headed by Emerald's Milan Bogdan, and a special events committee to be headed by Recording Arts owner Carl Tatz. Monthly meetings were scheduled for the third Thursday of each month.

If NAPRS succeeds, it will mark the first time that the large studio base of Nashville has organized. Nashville has no SPARS chapter, although representatives from the Society of Professional Audio Recording Services met with several board members in Nashville in January in a meeting arranged by Digital Atomics co-founder and Studio A owner Lisa Roy. While common technical and sales and marketing issues were brought up at the meeting, which was supervised by incorporating attorney Steven Roads, the specter that has loomed behind several studio organizations in recent years was subtly present at the meeting: personal home studios. In a point that was modified at the last minute, NAPRS's charter specified that voting membership was "...limited to those business entities dedicated in whole, or in part, to Professional Recording Services who have transacted business as a professional recording service for at least one calendar year, and can evidence their ability to transact business by a valid business license."

Several members questioned what would specifically constitute a "recording service," and a nonvoting membership status was discussed. Both issues were tabled for future discussion. However, toward the end of the meeting, Sullivan made a point of saying, "We're not here to police any studios, or anyone working out of their car." Sullivan also reiterated Roads' caution that any discussion of rates, the other major issue here as elsewhere, would be strictly illegal under existing federal antitrust regulations.

This next paragraph is pure editorial on my part: NAPRS has the potential to be more than the sum of its parts and could go far toward the ultimate realistic goal of projecting Nashville's studio base beyond its geographical boundaries. To do so, it needs to overcome the long-standing cultural conundrum that the city is viewed as something less than its coastal counterparts because it is limited by an association with country music and all the perceptual baggage that comes with that. The organization comes at a time of cyclically declining country music sales, a time when non-Nashville, non-country clients are needed more than ever. But to do so, NAPRS needs to find its own voice. That's already happening in the balance of the buoyant optimism of Nuyens, who stressed an almost doe-eyed positivism throughout the meeting, and the no-nonsense skepticism that Sullivan brings to the table. No serious disagreements have yet been raised within the organization, and it will take that kind of good-cop/bad-cop balance to keep any that do in perspective. Because if they don't, all the membership might have left to agree upon is Dino Elefante's meatballs.

Other News: **Soundstage Studios** has become the third Nashville facility to spring for an SSL 9000J console. The 80-input board, which was scheduled to be installed in Front Stage by late March, brings the number of 9000J consoles in Nashville to four, counting two at Starstruck's new facility and one at Masterfonics' new The Tracking Room. Soundstage studio manager Michael Koreiba said the choice of the 9000J was prompted both by a sense of competitive pressure with the other 9000s arriving in town and by a need to satisfy both tracking and mixing clients. "This gives people who want to use a 9000 another studio option," he said, "and it helps us get the people who wanted another tracking option." The 9000 will replace an SSL 4056 E/G, which will be moved to another room at Soundstage, replacing a Trident 80B.

Another New Studio: **Cool Springs Recording**, owned by Sandi Patti's ex-husband and producer, John Helvering, is under construction, designed by Steve Durr and slated to open in June

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with a refurbished, expanded 64-input API board with GML automation and Touch Reset Technology. Storage will be a pair of Studer A827s and a D827, with a new Studer D424-2 M/O recorder likely as the 2-track, according to studio manager Steve Schott. The one-room studio in the Franklin area, estimated at $1.5 million, will have a large (74x48x22-foot) tracking room with a full light grid for video shoots and three isos, the largest of which will be 16x36. Schott estimated the day rate for the facility at about $2,000 and noted that this would be Nashville's first large tracking facility that accommodates video production as integral to the studio's design and function. The studio is being financed by Helvering.

Woodland Digital opened a mastering division at the start of the year. Digital Editing & Mastering (DEM) is run by engineer Frank Green and employs a Sonic Solutions Sonic System for mastering and editing, as well as a Genelec 1092A/1030A monitoring system, Sony and Apogee converters, and Neve, TLA, NTI and other processing gear. The first project mastered in the room was a Kenny Rogers double-CD set.

And **TNN just bought an SSL 8000 GB** for its remote truck. The 48-input console, which has no automation as per the network's request, will be shown at NAB and then shipped to Nashville.

Dan Daley is Mix*'s East Coast editor. Fax him at 615/646-0102, or e-mail at danwriter@aol.com.*

—FROM PAGE 188, L.A. GRAPEVINE

tion has resulted in sound category nominations over the past four years for *Under Siege*, *The Fugitive*, *Clear and Present Danger* and now *Batman Forever*. These people have worked together on all four high-pressure films and still manage to stay on speaking terms! Ever busy, they're now working on Joel Schumacher's next installment in the Batman saga, *Batman and Robin*.

The party was held on a balmy Sunday evening (on what other day of the week could you get possibly get an entire sound crew together?), when 250 people gathered in front of the Stephen Ross Theatre to nosh, drink designer beers and decent wines and wait for the evening's entertainment—10-minute "sound bake-off" versions of all four of the films the team has been nominated for. The film industry has always been better at this kind of thing than the music-recording business (think catering on the sets and soundstages—film people almost always get more than the obligatory Studio C fruit basket!), but this event was particularly nice. Tablecloths, flower arrangements, waitpersons passing trays of very edible hors d'oeuvres—really quite civilized and pleasant. And, in return, civility was expected from the guests. Warners is (rightly) protective of the 516-capacity Stephen Ross Theatre. No food or drink allowed inside, and my date got busted by one of the vigilant Warner lot staff for trying to enter the theater while chewing gum. "The restroom is that way, sir. You can dispose of your gum there." ("Good catch," snickered the rest of the staff.)

Oh, and kudos to editor Dennis Virkler who compiles the ear-boggling bake-off (officially called highlight) reels that were screened that night. Created for award consideration by the Academy of Motion Picture Arts and Sciences, they are no easy task. Those tight cuts are especially challenging to make in that, due to the placement of the reader on the projector, the audio to picture sync is 27 frames off! Virkler tells us that he is given a wish list from the sound EFX editors, then he looks for the audio cuts first, because if he can make those work, the picture cuts will probably follow. Put together on the Lightworks system, the *Batman Forever* selection was particularly intense—I found myself exhausted after its nonstop ten minutes. "Yeah," laughs Virkler, "imagine how the people feel who have to screen three of four of those to choose the one to submit!"

On the music recording tip, this month we checked in at A&M Studios to see what's been happening in the year since principal and moving force Shelly Yakus departed from the scene, passing the reins of management to Ron Rutledge and his assistant Bob Borbonus. The joint is jumpin'—at least it was on the day I was there. All five rooms were running, with 3348s dominating the format wars (four rooms out of five were digital multi). Neil Dorfsman was in Studio A on the custom Neve 4972 engineering Kyosuke Himuro for producer Hero. Studio B, with its SSL 6056/TR, had Hide in recording with engineer Bill Kennedy, and ensconced in API 32-in-equipped Studio C was the lone analog holdout, producers Me'N'Al with the Blue Meenies. In D, the SSL 4072G room, were engineer Stan Katayama and producer Ishikawa recording Greg Adams' horn arrangements for Epic/Sony Japan act Wild Style, and in Studio M (or Mix) was producer Phil Ramone overseeing work on Johnny Mathis' latest, with Kaz Masumoto engineering on the SSL 6072E.

Rutledge and Borbonus sat me down in the cozy "fish tank" lounge, and we discussed the philosophies of change. The buzz concepts at A&M these days seem to be friendliness and populism, which appeared contrary to the vibe of the facility a few short years ago, when a studio manager friend of mine from the Bay Area visited there and commented about her tour, "Well, they seemed kind of hung-up on themselves. There were only certain areas of the facility I could see because 'people were working in the other spaces.'" (This bemused comment from a studio manager, who, believe you me, has seen everything.)

Rutledge is circumspect in describing the past year's changes. He says, "The transition is difficult to talk about. All I know is I was hired to come in and make this place what it used to be. And I think we're a little less elitist and more user-friendly than we were."

Adds Borbonus, "Remember, in the beginning this was Herb Alpert's recording studio. The focus was never on making a profit, it was on making a record. If you had a problem, you called Herb and he took care of it. Now, A&M Studios is owned by PolyGram. PolyGram owns A&M, Island, Mercury, something like 20 labels. The studio had become more of a business, but it wasn't run well as a business. So there was a transition to be made to combine the creative focus with the bottom line. It was a difficult time, and there was a period when rumor central in the community thought we were going to go away. Then, about the time that Ron was hired on as traffic manager, all of a sudden things changed. Basically, the top three management slots were vacant, and it became 'Here's the ball—run with it!'"

"So I just watched the overhead," continues Rutledge (who previously worked as studio manager at Precision Mastering), "booked the rooms as much as possible, and we've had pretty good luck so far. It's not a magic thing, but it is a change in management style and in how people were treated."

"Honestly, it was really on its way down here," explains Borbonus, "and in 1995 we were told, 'Okay, go for it guys, and see what you can do.' They wanted to see if the studios could be a viable entity on their own. Now that they see that it works they are supporting us 110 percent. The CEO is behind us, and our budgets and plans for improvements have been approved."

Queried on the touchy subject of rates, Rutledge says, "We are as competitive in the industry ratewise as anyone else. We are not the unapproachable, elite thing that people think we are. Before, perhaps, management was not willing to negotiate anything—it was 'This is our rate, it's higher than anyone in town, and if you don't want to pay it, why are you calling?' That kind of attitude, well, it doesn't work anymore. It doesn't mean that we are giving the place away or cutting our rates, but it's a matter of working with people and helping them out to get the project done. That's what you have to do. You just have to work with people. That's our philosophy. And I think we're a kinder, gentler studio now."

On the topical issue of pursuing post-production work, Rutledge says, "We are open to anything. But I'm a rock 'n' roll kind of guy. I love this and wouldn't want it to change."

Besides the five recording studios, A&M has six mastering suites, the most

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well-known being the one manned by Dave Collins, who recently mastered Soundgarden's new release and Springsteen's *The Ghost of Tom Joad*. The five other suites have been busy with projects from 3T to Chick Corea, and the soundtracks to *Nixon* and *Apollo 13*. Also busy is the post-production/copy suite, an impressive area capable of running CD refs or up to 120 cassette and five to six DAT copies in real time. Newly opened is the archiving room, currently working on preserving the A&M catalog by transferring to ½-inch analog and Sony 9000. Plans are for the archiving room to be available to outside clients soon. Take a look at A&M's Website: www.amstudios.com.

Of utmost importance to both the film and record worlds are the ears of our music and sound makers. This month, I stopped in to visit **Charlie Lahaie at downtown L.A.'s House Ear Institute**. Lahaie was the author of "Protecting Your Hearing," which you can find in the January '96 issue of *Mix*. If you haven't read it, you should. Remember, true noise-induced hearing loss is irreversible, but preventable. So dig out your January issue. Lahaie, whose title at House Ear is Director, Public Relations/Community Outreach, is very connected to the music world, dispensing advice and ear plugs to denizens of the arena from jazz to rock and rap. She's also seemingly fearless when on a mission. In spite of the fact that *Mix*'s TEC Awards donates half of its proceeds to House Ear Institute research, she's been known to call and berate *Mix* editors when what she sees as a "double standard" shows up in print—meaning the glorification of SPL, both in advertising and in the macho "Turn it up, my ears aren't bleeding yet!" attitude that some producers still employ in the studio.

House Ear itself (named for Dr. Howard House) is one of the finest otologic (hearing) centers in the world and celebrates its golden anniversary this year. Fifty years ago, the institute was established with donations from two grateful patients of Dr. House, after he'd restored their hearing with innovative surgical techniques. Since then, research at the Institute has had wide-ranging results. The Institute has the largest documented set of ear and related auditory structures (read, inner ear bones) in the world and is a primary resource for many scientific studies. It was involved in developing national hearing safety standards, and ongoing research focuses on education and prevention of hearing loss, surgical techniques for correction, and enhanced support for the deaf through studies of how language is understood and development of prostheses (hearing aids, etc.).

Although Lahaie has a special fondness for her involvement with the music industry, the bulk of her work is with children—helping those with hearing problems and providing preventive education. To that end, HIP (Hearing Is Priceless, the joint venture between House Ear and *Mix*) has created a video called "Hip Talk," educational material on noise pollution and hearing protection that is available for schools. (I bet you didn't know that personal stereos are capable of producing sound levels of more than 115 dB, and that most people listen through their headsets at volumes of 100 dB or more. This includes your child's My First Sony!)

Lahaie is also an advocate of Musician's Earplugs. Manufactured by Westone Laboratories, and available through House Ear for $110, the ER-15 and ER-25 provide nearly equal attenuation at all frequencies. They use a diaphragm—similar to a passive speaker cone—to achieve such flat response, avoiding the problems of conventional earplugs, which often provide 10 to 20 dB of extra high-frequency attenuation or may attenuate more than necessary.

Lahaie, the realist, offers an example of their use for live sound engineers. "After you establish your basic levels at soundcheck, and in the first few songs of the show, put them in. Engineers may be at the venue for ten hours overall, and they are at even higher risk than the musicians. This way, they avoid prolonged exposure without hurting their ability to mix."

Although HIP has an advisory board that includes Danny Elfman, Bob Clearmountain and Les Paul, among illustrious others, Lahaie struggles with her own Catch-22—the media often wants to know specifics about hearing loss in the mubiz, and what musician, producer or engineer wants to let the world know they have hearing damage?

Still, she sees an increase in awareness over the past few years. "When HIP first had a booth at the NAMM show, people were really puzzled," she laughs. "They'd stare and say, 'What the hell are you doing here?' Now, they hit our booth to get their earplugs before they hit the show floor." ■

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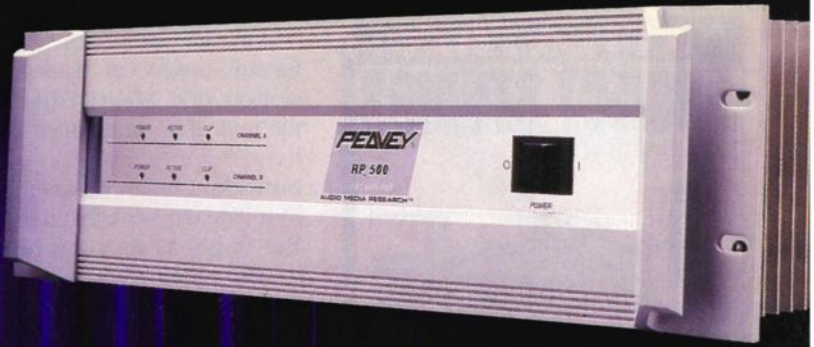

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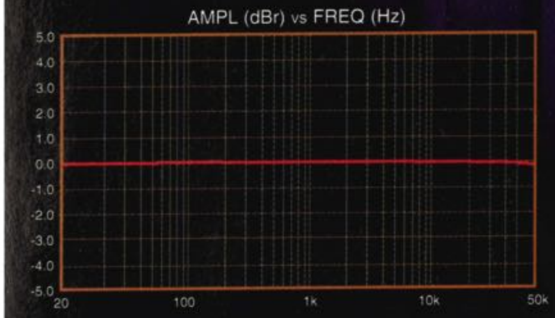

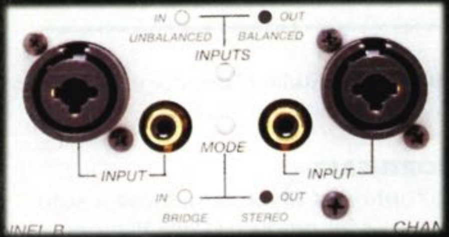

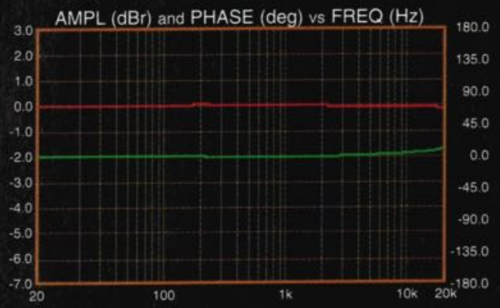

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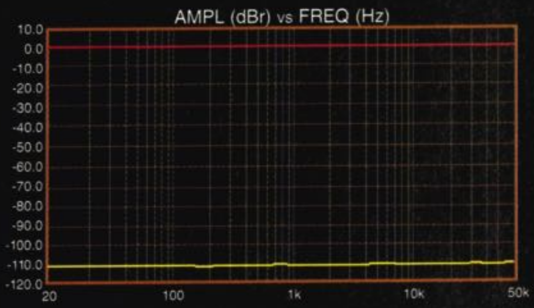

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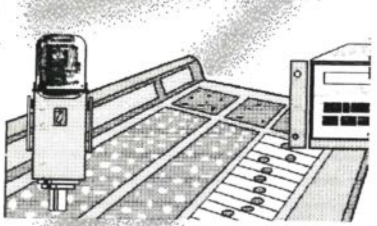

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—FROM PAGE 188, NY METRO

for sure unless you want to make a career out of it. What'll happen? I think in the end, if it goes out of business, it'll be just another studio going out of business. I mean, in a way, it's a great idea: Sue the bank that lent you money. But I'd just as soon this be over with."

The pragmatists have a serious ally in this response, though: "Tony's trying to hold on to his castle," one said, "even if his castle winds up not being his anymore. I don't blame him in a way. I'd like to see him hang on, if for no other reason than that West 53rd Street has become a studio monopoly. I like the idea of having Tony up there to annoy the other big studios."

In the end, though, this response put it into a larger perspective: "It's symptomatic of what's going on in general. We got so focused on project studios that we started forgetting that we had to tend to business no matter what else was going on. It no longer matters what kind of console or tape machine or outboard equipment you have, or who designed your studio. That's not enough anymore. You have to run a studio like you would any other business. You have to take care of business first. These are very different times we live in now."

In other news: **James Williamson has been named chief tech at Masterdisk**. Williamson came to Masterdisk from Sony Music Studios earlier this year, where he was senior engineer. Scott Hull is now chief engineer at Masterdisk. The facility has also just begun using HDCD technology; the first project to use it there was Spyro Gyra.

Room With a View has added a new editing suite centered around a CD-R preparation service. Commissioned in March, Room Service offers limited editing, sequencing and mastering capability aimed primarily at serving studio customers' premastering needs, said studio owner Alessandro Cecconi. Room Service features Yamaha, Sony and Plasmon CD-R decks and a Yamaha 02/R digital console. The new suite is wired fiber-optically on a network file server to the studio, allowing files to be sent digitally between rooms. ■

Dan Daley is Mix's *East Coast editor. E-mail him at danwriter@aol.com.*

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—FROM PAGE 189, SESSIONS & STUDIO NEWS

the executive producer...

SOUTHERN CALIFORNIA

Dale Watson mixed his latest HighTone Records release, *Blessed or Damned*, at **Mad Dog Studios**, Burbank, with engineer **Michael Dumas**. Dwight Yoakam's fiddle player **Scott Joss** was also in mixing a solo LP for Little Dog Records with Dumas and **Judy Clapp**...In Studio A at L.A.'s **Image Studios**, producer **Tetsuya Komuro** was cutting tracks with artists **Dos** and **Amuro Namie**; **Terri Wong** and **Eric Westfall** engineered...Producer **Jorge "G Man" Corante** was at **Skip Saylor Recording** (L.A.) with mixer **Rob Chiarelli** working on **CeCe Peniston**'s new single "Movin' On" for A&M. **Rod Michaels** assisted...Former Bangle **Susanna Hoffs** mixed her upcoming solo outing for PolyGram at **The Village Recorder** in L.A. **David Baerwald** produced, **Jim Scott** engineered and **Jeff Thomas** assisted...**Little Feat** mixed their new Zoo Records live album on the 8078 at **Brooklyn Recording** (L.A.) with producer **Bill Wray**, engineer **Nathaniel Kunkel** and assistant **Ronnie Rivera**...Jazz legend **Dave Brubeck** and GRP recording artist **David Benoit** were in Benoit's **29th Street Studio** (Torrance) cutting a duet for Benoit's next album...

NORTHEAST

Saxophonist **Myanna** tracked a solo project with producer **Dave Weisner** at **Soundtechniques** in Boston. **Dave Kirkpatrick** engineered with **Scott Robertson** assisting...**Withstand** tracked and mixed a Futurist Records release at **Cotton Hill Studios** (Albany, NY) with producer/engineer **Steve McAllaster** and assistant **Ted Malia**...At New York's **Kampo Cultural Center Studios**, **Joe Gallant** and **Alec Head** mixed a live recording of the **Iluminati** orchestra's *Blues for Allah Project* with staff engineer **Dave Robbins**, due this month on Knitting Factory Records...Jazz bassist extraordinaire **Christian McBride** recorded his second Verve release in Studio A at New York's **Clinton Recording**. Producers **Don Sickler** and **Richard Seidel** worked with engineer **Jim Anderson** and assistant **Adam Blackburn** in tracking guest players such as Chick Corea, Jack DeJohnnette and Kenny Garrett...Rising R&B sensation **Joe** recorded and mixed tracks for his self-produced Jive Records debut at **BearTracks Recording** (Suffern, NY) with engineer **Earl Cohen** and assistant **Steve Regi-**

na...Brooklyn's **Excello Recording** has been busy with some happening sessions: RCA artists **Babe the Blue Ox** cut their latest with engineer/producer **Bryan Martin**, while B-52's frontman **Fred Schneider** worked on a solo project for Reprise with the notorious **Steve Albini**...Guitarist **Jeff Ciampa** recorded his first solo release, *Signs of Life*, at his producer **Mark Egan**'s **Electric Fields Studio** (Warwick, NY). **Richard Brownstein** engineered...

NORTHWEST

Recent sessions at **Room One Recording** (Tacoma, WA) included **Blue Healer**, featuring Tad Doyle, and **Simple Cain** (tracking and mixing their debut with engineer **Mike Caviezil**)...**Samiam** worked on their sophomore effort for Atlantic at **Studio D Recording** in Sausalito, CA, with producer/engineer **Steven Haigler** and assistant **Mike Cresswell**...Cool African jazzers **Cape Verde** and **Amandio Cabral** recorded and mixed tracks with engineer **Daryn Roven** for an upcoming release in Studio A at **Russian Hill Recording** (San Francisco). Also, the studio added a new Pro Tools III suite, featuring 16 tracks of digital editing and mixing...

SOUTHEAST

Canadian snowbird **Anne Murray** fluttered down New Orleans way to cut a duet for her new EMI Music Canada album with **Aaron Neville** at **Ultrasonic Studios**. **Ed Cherney** produced. **The Dirty Dozen Brass Band** were also in working on their next release for Rhino Records with producer **Gregory Davis** and studio chief engineer **David Farrell**...Sub Pop artists **Plexi** mixed their new album in Studio A at **Ardent Studios** (Memphis, TN) with producer/engineer **Jeff Powell** and assistant **Jeffrey Reed**. In Studio B, producer **John Hampton** mixed **Big Tent Revival** for Ardent Records with co-producer **Dana Kay** and assistant **Skidd Mills**...**Reflection Mobile** (based in Charlotte, NC) recorded portions of the new **Rev. Billy C. Wirtz** live album for High-Tone Records at the Be Here Now club in Asheville, NC. **Bruce Bromberg** produced, and engineers for Reflection were **Mark Williams** (who also mixed the tracks) and **Robert Preston**...**Cool for August** recorded and mixed a song for an upcoming episode of *The X-Files* at Atlanta's **Triclops Recording** with producer **Matt Serletic**, engineer **Jeff Tomei** and assistant **John Nielsen**. The band will return to the studio (which recently added a second Studer A800 24-track) to record their next Warner Bros. re-

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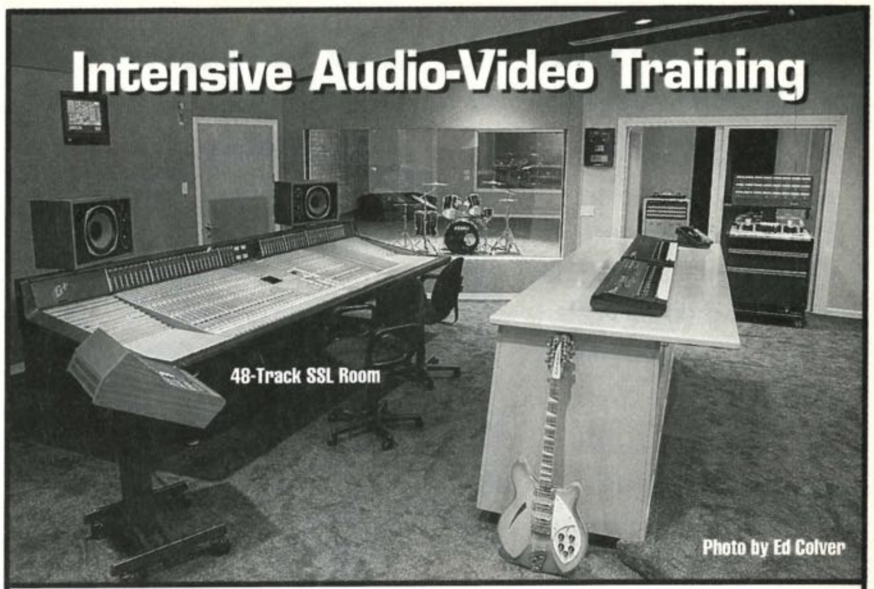

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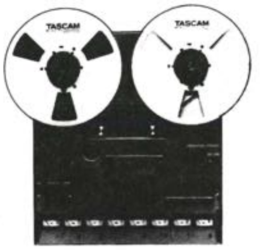

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lease...Running the gamut at **Criteria Studios** (Miami): Epic artists **Corrosion of Conformity** cut tracks for their next release with producer **John Custer** and engineers **Jason Corsaro** and assistant **Mark Dobson**; renowned tenor **Placido Domingo** was also in tracking with producer **Bebu Silvetti**, engineer **Carlos Nieto** and assistants Dobson, **Chris Spahr** and **Scott Kieklak**...Producer **David Rosenthal** and singer/songwriter **Jenna Drey** were in mixing at Miami's **Crescent Moon Studios** with engineer **Eric Schilling**...

STUDIO NEWS

Country great **Mel Tillis** moved his studio from Nashville to a newly constructed space inside his Mel Tillis Theater in Branson, MO. **Russ Berger Design Group** designed the studio, which houses a 32-input **Euphonix**...**National Public Radio** in Washington, D.C. is making its flagship Studio 4A available to the public. At almost 2,000 square feet, the well-equipped studio is based around an **SSL 4048 G Plus**...Recording studio **Toast** is officially open for business in San Francisco. Located in the former site of Coast Recorders, the studio features a **Neve 8026**, **Sony 3348** digital 48-track and a **Studer 800** 24-track. The first project at Toast was a remix of **Pete Townshend**'s "Let My Love Open the Door" for a greatest-hits album on Atlantic. ■

—FROM PAGE 189, RANDY DEFORD

self-produced album projects, engineered a few jingles and, in a collaboration with two friends, created a demo reel of radio promo spots called Voyces in the Night, which he hopes will provide an entree into more post-production writing work.

"Make no mistake about it," DeFord says, "if my economic ability were enhanced, say, tenfold, I would have an Otari or Euphonix board. Right now, I represent thousands of home recordists who have moved over from purely writers or interested audiophiles to those who can create viable, commercially usable recordings for any medium. I'm a spring design engineer, and I create designs for production that may produce millions of the same part for an automobile. The machines cost thousands of dollars and are created for fast turnover. However, you can create a great product with a $200 hand coiler and a bit more time. That's how I view a project studio." ■

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PatchWerk Recording Studio is Atlanta's newest world-class production facility. We offer an ideal creative environment with first-class personal service, creating an unparalleled value. The beautiful 3000-sq.-ft. facility features an Otari Concept One (64-input/output) w/Virtual Dynamics and VCA faders, a Studer A827 recorder and Spectral Synthesis direct-to-disk digital recorder w/Prism audio interface. Recent clients include: Outkast, Monica, Xscape, Goodie Mob, Subway, Ras Kass, Organized Noize, Usher, Vooodu, Total, The Group Home, Meen Green. Contact Curtis Daniel.

▪ STUDIO SHOWCASE ▪

Blue Earth Recording Corporation

210 Blue Earth Lane, Harrisburg, IL 62946
(618) 252-6434; Fax (618) 253-5607
(800) 484-8140 ext. 6434
e-mail: bluearth@intrnet.net

This is one of the Midwest's best-kept secrets. Tucked away at the edge of the Shawnee National Forest is this French plantation-style recording studio complex. All pro 24-trk. with mastering suite. Control features Amek 78-input console, outboards and mics. Don't miss this great opportunity for recording, mixing and mastering your project in a peaceful and quiet vacation atmosphere. Competitive rates—all arrangements made for you. Contact Richard Banks, Director.

Savebone Music Inc.

130 West 42nd St., Suite 952
New York, NY 10036
(212) 997-0206; Fax (212) 997-0481

Recent projects feature former Rolling Stones guitarist Mick Taylor, Sasha, Carlos Alomar, Lenny Pickett, Robin Clark, Steve Ferrone, T.M. Stevens, Vivian Cherry, and Tawatha Agee. The engineer is Nenad Gracanin and the producer is Sasha. Studios feature SSL 4064, G Series computer, Studer A827, Sony PCM 3324, Sony PCM 800s, state-of-the-art recording, mixdown and mastering. Highest possible quality is our main concern.

Artisan Recorders Mobile

PO Box 70247
Ft. Lauderdale, FL 33307
Tel/Fax (954) 566-1800

Artisan Recorders is entering our 20th year serving the remote recording and broadcast industry. Along with an extensive array of equipment in a comfortable aesthetic environment, our 36-foot "Mobile Red" trailer boasts an expert staff of technicians with a love of music and desire for perfection. Recent credits include Hootie & The Blowfish, Trisha Yearwood, Luciano Pavarotti and many more. Please call Natalie for more information.

Hotdish Mastering

143 Bates Ave.
St Paul, MN 55106
(612) 776-4611; Fax (612) 778-1776
e-mail: CadillacP@aol.com

Mastering services from simple transfers to delivery formats (1630, CD-R, Exabyte) to fully tailored program-dependent polishing. Other services: digital editing/sweetening/restoration/archiving. Flat rate prices/brokering available. Custom-designed monitor environment flat from 23 Hz to 30+ kHz. 24-bit signal path includes Sonic Solutions, TC Electronic M5000. Analog formats accepted. Customer satisfaction is our primary goal. Contact Phil Mendelsohn for more information.

Performance Recording

Orland Hills, IL
(708) 349-9471; Fax (708) 349-5015

Founded in 1995, in collaboration with ouR® House Inc., Performance Recording was developed primarily as a studio for artist C/D and demo recording. The studio is equipped in part with an Otari 2"-24 MTR-100, 32 tracks of ADAT XT, an Amek Big console, Genelec monitors and literally a "Who's Who" of outboard solid-state and tube processing equipment. An extensive collection of vintage tube and condenser microphones, several amps and a B-3 organ round out the gear. The studio was recently tuned by Bob Hodas. Dyaxis digital editing and CDR writing are also available.

Commercial Recording Studios

6001 West Creek Road
Independence, OH 44131
(216) 642-1000; Fax (216) 642-0615

Perched majestically above a meandering creek, and conveniently located 12 minutes from the Rock and Roll Hall of Fame, Commercial Recording is Cleveland's connection to the world via DG, DCI, Telos Zephyr, ISDN and DDD-2. From music composition and video interlock to foreign language translation and everything four Lexicon OPUS Digital Audio Workstations can handle, this is where sound is happening on The North Coast.

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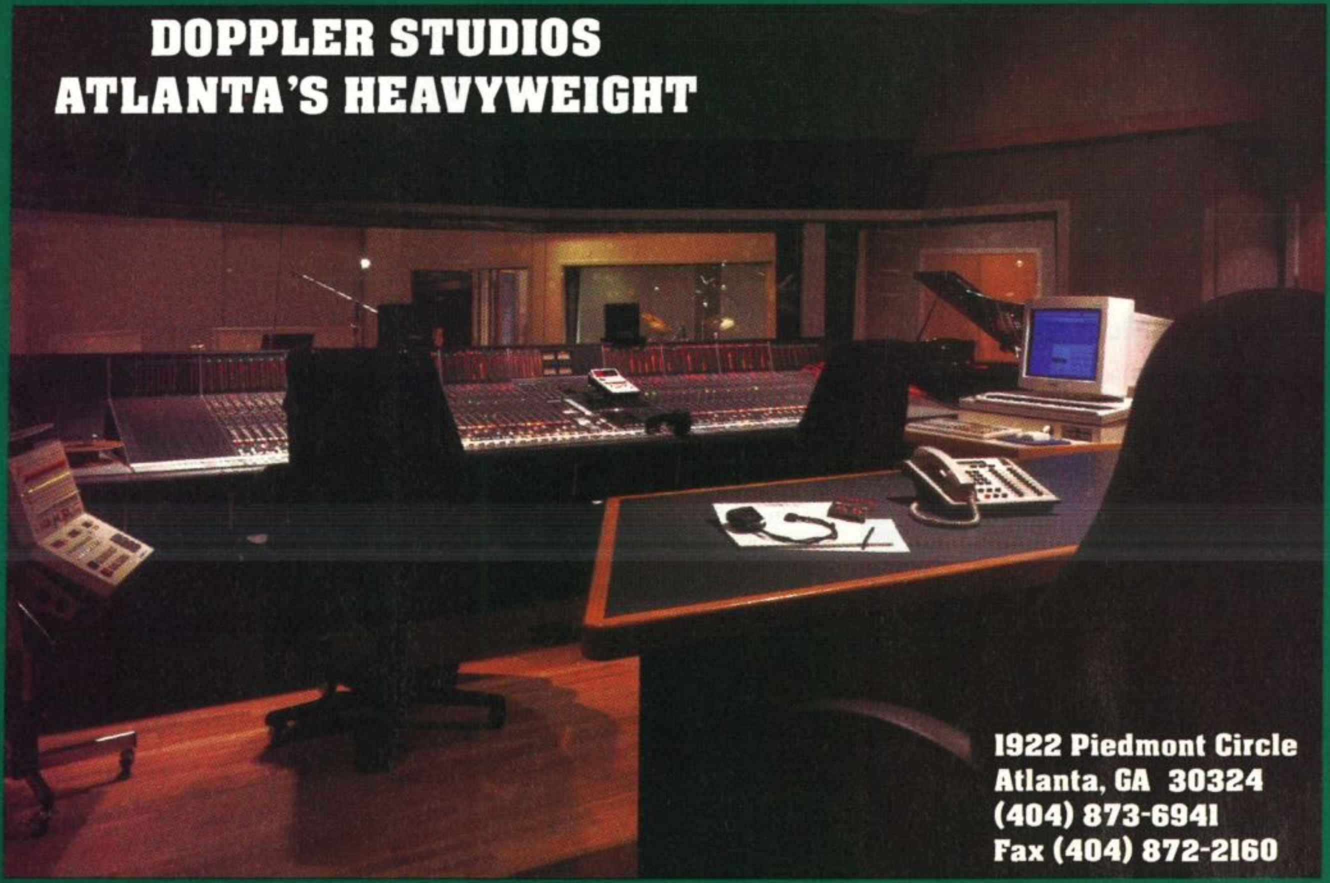
(312) 486-1459

Located five minutes from the Loop, the Uberstudio's 2000-sq.-ft. facility brings together outboard gear and mics by the likes of Manley, AKG, Sony, Altec, VTL and Sennheiser with the sonic harmony of Neotek Series IIIC console, MCI JH24 and 24-track ADAT. Live music is our specialty. Clients include Wickerman, Red Red Meat, Ken Vandermark, The Monomen, The Queers, Mats Gustafsson, The Vindictives and Roy Montgomery.

EastSide Sound

98 Allen Street
New York, NY 10002
(212) 226-6365; Fax (212) 226-0788

EastSide Sound has been satisfying clients for 24 years. Our tracking room boasts a vintage Neve with David Manley tube modifications and Flying Faders. Our mixing room houses the Harrison Series Ten B—the ultimate in automation. Both rooms include Studer and Sony tape decks, a wide selection of both vintage and modern mics and outboard gear, as well as computer workstations. Located in Manhattan, private and very comfortable. Call for further information.



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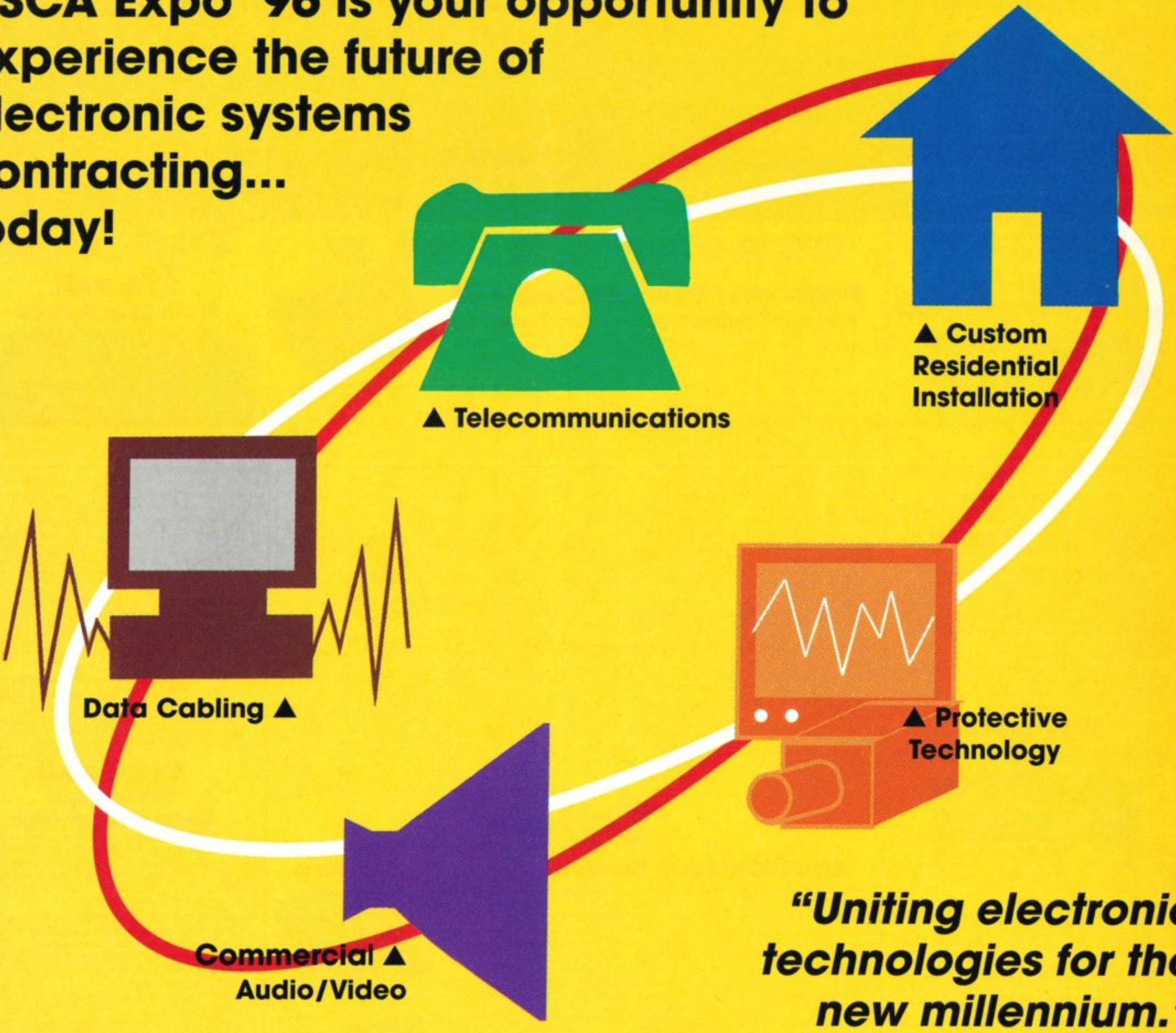
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TASCAM

102 MKII / 103

Stereo Mixdown Cassette Decks

Best values for musicians, studio operators and production houses, the 102 MKII and the 103 consistently produce only the higest quality tape recorded output.

They Feature:
- 60dB signal-to-noise ratio combines with wide frequency response for high-fidelity sound reproduction using any type of cassette tape.
- Industry-standard Dolby B/C noise reduction and Dolby HX Pro sound technology extends high frequency performance up to 6dB and minimizes distortion.
- Advanced bias -sensing electronics automatically chooses optimal recording settings for the type of tape you load in—Normal, Metal or Cr02.
- Record/Mute autospacer automatically inserts 4 seconds of silence between songs or broadcast segments
- Multi-function display clearly indicates transport mode, tape counter position, tape type and level indicator
- Multi-counter with both tape counter and run-time modes
- Independent L and R stereo level controls and master record level control

Tascam 103 Advanced Features:
- 3-head system allows you to record on a tape and monitor it at the same time, without rewinding.
- MPX filter button eliminates pilot and sub carrier broadcast tones that can interfere with Dolby noise reduction

202 MKIII

Dual Auto Reverse Cassette Deck

The 202 MKIII provides high-fidelity sound reproduction and a wide frequency response, as well as a host of features that help you dub, edit, record or playback onto/from one or two cassettes easily and efficiently.
- Normal speed and high-speed dubbing
- Autospacer automatically inserts 4 seconds of silence between songs or broadcast segments for pro quality tapes
- Incorporates Dolby HX Pro sound technology to extend high frequency performance and minimize distortion on Mormal, Metal and CrO2 tape.
- Allows you to quickly and easily create a professional-sounding composite tape from several sources. Functions like Intro Check, Computerized Program Search, Blank Scan and One Program quickly find the beginning of tracks you want.
- Twin two-head cassette decks in a durable rack-mount housing that can be used separately or in tandem during recording and playback for total flexibility:

–***Play*** material on deck 1 while deck 2 records on one or both sides
–***Record*** simultaneously on both decks from an external master
–***Play*** back both sides of one or both decks in a continuous loop, up to five times
–***Auto Reverse*** automatically reverses tape direction during playback and record
–***Repeat*** rewinds tape and allows infinite looping during playback
–***Timer*** switch for unattended record/playback (timer required)

New! 302

Double Auto Reverse Cassette Deck

All the features ot the 202 mkIII, the new 302 adds even more recording and playback flexibility. Thats because the 302 is actually two fully independent cassette decks. Both decks have their own set of interface connectors, transport control keys and noise reducing functions.
- Auto-reverse capability on both decks
- Individual/simultaneous record capability–both decks
- Independent RCA unbalanced in/out for each deck
- Cascade and Control I/O let you link up to 10 additional machines for multiple dubbing or long playing record and playback applications

CD-601

Professional CD Player

Frame-accurate cueing precision, extremely high-fidelity and a small form factor make the CD-601 ideal for post-production applications where sound effects and music are "flown-in" from compact discs. The CD-601 integrates with most post-production equipment including mixers, video editors and computer studio controllers.
- Balanced XLR and unbalanced RCA outputs
- Precision cueing control and Auto cue
- Linear motor-driven pick-ups eliminate dead air
- Optional RC-601 remote control adds additional features and conveniences
- Optional BU-2 RAM for instant start and seamless loops up to three minutes

marantz®

PMD-101/201/221/222/430

Portable Professional Cassette Recorders

The world standard for field recording, the PMD line is also the value leader. They all feature RCA line input/outputs, 1/4-inch headphone jack, built-in speaker, pause control, audible cue and review, tape counter, full auto shut-off and low battery indicator.

- All models except the PMD-430 have 1/2 speed playback/record capability. With 1/2 speed playback, musicians can slow down complicated passages for analysis. And when played back at 1/2 speed, the pitch is lowered by exactly one octave, so the notes are still musically correct—ideal for figuring out complicated solos or picking patterns.
- By recording at 1/2 speed, a three hour meeting can be recorded on a single tape. A built-in microphone and automatic level control make operation simple, and built-in speaker makes transcription convenient.
- 1/2 speed recording is equally ideal for churches, because 90 minutes can be recorded on a single side of tape—no interrupting your recording to flip the tape over. Line inputs make it easy to use and connect to your existing sound system.
- Three standard 'D' cell batteries provide up to 7-1/2 hours of operation and the optional RB430 rechargeable battery delivers up to 5-1/2 hours.

General	**PMD-101**	**PMD-201**	**PMD-221**	**PMD-222**	**PMD-430**
Stereo/Mono	Mono	Mono	Mono	Mono	Stereo
Heads	2	2	3	3	3
Inputs/Outputs					
Mic Input	1/4-inch	Miniplug	Miniplug	Mini/XLR	1/4-inch
Condenser Mic	Built-In	Built-In	Built-In	Built-In	—
Remote Jack	—	Yes	Yes	Yes	—
Modular Tel. Jack	—	Yes	Yes	Yes	—
External Speaker Jack	—	Yes	Yes	Yes	—
Record Controls					
VU Meters	—	1	1	1	2 (Illuminated)
2-Speed Recording	Yes	Yes	Yes	Yes	—
Dolby B NR	—	—	—	—	Yes
dbx NR	—	—	—	—	Yes
Mic Attenuation	—	0,-10dB, -20dB	0,-10dB, -20dB	0,-10dB, -20dB	0,-15dB, -30dB
Ambient Noise Cont.	—	Yes	Yes	Yes	
MPX Filter	—	—	—	—	Yes
Manual Level Control	—	Yes	Yes	Yes	—
Limiter	—	Yes	Yes	Yes	Yes
ALC	Yes	Yes	Yes	Yes	—
Peak Indicator	—	—	Yes	Yes	—
Playback Controls					
Pitch Control	±20%	±20%	±20%	±20%	±6%
Bias Fine Adj.	—	—	—	—	Yes
Tone Control	Yes	Yes	Yes	Yes	—
Half-Speed Playback	Yes	Yes	Yes	Yes	—
Memory Rewind	—	—	Yes	Yes	Yes

Telex

ACC2000/4000 Series Cassette Duplicators

Designed for high performance and high production, Telex's ACC Series (ACC2000/ACC4000) and (ACC2000 XL/ACC4000 XL) of expandable duplicators also offer easy maintenance and unsurpassed ease of use. The ACC2000 is a two -channel monaural duplicator, the ACC4000 is a four-channel stereo duplicator.Each produces 3 copies from a cassette master at 16 times normal speed and each can expand up to 27 copy positions (with additional copy modules).With the extra copy modules, you can duplicate up to 27 copies of a C-60 original in less than two minutes.And they copy both sides at once.The XL Series feature "Extended Life"cassette heads for increased performance and wear characteristics.They also offer improvements in wow and flutter, frequency response, signal-to-ratio and bias. Additionally the ACC4000 XL allows for either chrome or ferric cassette duplication. XL- models are available in stereo (ACC4000 XL) or mono (ACC2000 XL) versions.

Fingertip Operation
- Individual rotary audio level controls allow for an increase or decrease of audio levels as the master translates to the copies.
- Peak reading LED indicators allow quick and accurate monitoring of audio fluctuations.
- Side A or A/B select button let you set up for duplication of either 1 side or both sides of a cassette at once.
- Stop all tapes instantly, at any point during the copy or rewind cycle.
- Short tape indicators alert you if a tape stops before the original does, identifying incomplete copies caused by jam or short.
- Automatic or manual selection of rewind and copy operation:

–Rewinds tapes to the beginning or end automatically (AUTO mode) or manually.
–In AUTO mode the copy button activates the entire rewind/copy/rewind sequence. In manual it starts copying immediately.

Easy Maintenance:
- Slanted work surface and unique "heads-up" cassette platform allow less oxide build up on the heads and makes cassette loading and unloading much easier.
- Each cassette position has a three point tape guidance system that eliminates skew problems. Plus, when a tape is inserted, each cassette position is activated to prevent unnecessary wear and tear on the tape head mechanism.
- Audio and bias, along with head adjustments, are made easily from the top of the unit and a switch on the back engages the head and pinch roller for convenient cleaning.

ACC2000 Mono MasterModule:
- 1/2 track,two-channel monaural duplicator produces 3 copies from a cassette master at 30ips (16X normal speed).
- Expands up to 27 copy positions by adding ACC2000 copy modules (four positions each).
- Erase heads in the copy positions automatically erase existing audio as new material is being recorded.
- Track select,short tape indicators,auto/manual operation.
- Includes removable power cord and protective dust cover.

ACC2000 XL Mono Master Module:
- Same features as ACC2000, ***plus***– Extended Life cassette heads.

ACC4000 Stereo Master Module:
- 1/4 track, four-channel stereo duplicator. Same features as ACC2000 Mono Master Module/

ACC4000 XL Stereo Master Module:
- All features as ACC4000, ***plus***– Extended Life cassette heads. Can be configured for chrome or ferric cassette duplication.

ACC2000 Mono Copy Module:
- 1/2 track, two-channel monaural copy module.
- Each module has four copy positions with erase heads and controls for side select.
- LED displays indicate end-of -tape status for each pocket.
- Includes ribbon cables for connection to ACC2000 master and other copy modules.
- Includes removable power cord and protective dust cover.

ACC2000 XL Mono Copy Module:
- Same features as ACC2000 Copy Module, ***plus***–Extended Life cassette heads. Connects to ACC2000 XL Master Module.

ACC4000 Stereo Copy Module:
- 1/4 track,four-channel copy module. Has all the features of the ACC2000 Copy Module.

ACC4000 XL Stereo Copy Module:
- Same as the ACC4000Copy Module, ***plus***–Extended Life heads. Configurable for chrome or ferric cassette duplication.

Copyette EH Series Duplicators

The popular Copyette series produces high quality, low cost cassettes in large quantities at nearly 16 times normal speed.This means you can reproduce both sides of a C-60 tape in less than two minutes. Available in two versions,the Copyettes are capable of duplicating either one cassette or three at a time. In addition each are available in both mono and stereo models.

They couldn't be easier to use.You simply insert the cassettes, press the START switch and they do the rest. They rewind all tapes to the beginning, copy, then rewind to the beginning again before stopping. The whole process can be stopped at any time by pressing the CYCLE button. Side Select feature allows you to set them up to copy one side of a tape or both sides at once.

Stereo Copyette 1•2•1

Weighing only 8 lbs. (3.6 kg), this unit has a durable, impact resistant housing and includes a removable power cord, carrying handle and protective cover.It also has an optical , non-reflective end-of -tape sensing system that provides gentle tape handling.A mono version is also available.

Stereo Copyette 1•2•3

This duplicator copies both sides of three cassettes at once, yet it's as small as the 1•2•1. It weighs only 12 pounds (5.4 kg) and includes a hard cover to protect the unit while not in use. It uses all DC Servo motors for the ultimate in reliability .A mono

TASCAM

112 MKII

Stereo Cassette Deck

The classic "no frills" production workhorse, the 112 MK II is a 2-head, cost effective deck for musicians and production studios. Extremely rugged and reliable, the 112 MK II is ideal for production mastering and mixdown. It also features a parallel port for external control an and optional balanced connector kit means it is flexible enough to integrate into any production studio.
- Utilizes Dolby B or C noise reduction with Dolby HX Pro
- Automatically selects proper bias type, so you get optimal recording & playbank response with Normal, Metal or Cr02 tape.
- Gear independent input dials let you dial in stereo VU calibration with one dial. You can also adust for channel specific calibration.
- Offers two Autolocator buttons and a MEMO IN control. Thes controls allow you to select two points on any tape for one button forward/reverse to wherever the action is. Additionally RTZ (return to zero) quickly spools the tape back to 0000 on the tape counter.
- Rear-mounted RCA input/output jacks for easy connection to high-quality sources
- Optional LA-112 connector provides addtiional balanced or unbalanced XLR inputs and outputs .Installation is simple and requires no special tools.
- 25-pin D sub connector (parallel port) on the back, links the deck to the optional RC-134 remote control unit or for fader start from any mixer that use the same protocol.

112R MKII

Bi-Directional Stereo Cassette Deck

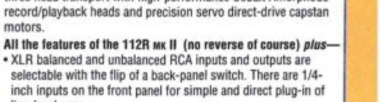
The 112R MKII is a sonically uncompromising, auto reversing and continuous play cassette deck. It offers the finest independent head auto-reverse design at this price level, plus it has extra dubbing and editing features that make it ideal for long program recording.

All the features of the 112 MK II *plus*—
- Three-head transport with separate high-performance record and playback heads. Manufactured from resilient Cobalt Amorphous materials, the independently-operating heads combine with precision FG servo direct-drive capstan motors to provide the highest standards of reproduction quality and performance.
- Frequency response is 25 Hz to kHz with less than 1% total harmonic distortion.
- Equipped with Hysteresis Tension Servo Control (HTSC) the 112R MKIIvirtually eliminates wow and flutter. HTSC is an advanced servo control system that maintains consistent back tension on the tape all through the reel, combatting inconsistencies brought on by extreme temperatures and humidity.
- Super Acculign Rotating Head System alllows recording or playback tape direction to be changed with one button. A single-screw azimuth adjustment makes it easy to maintain the head alignment after many hours of continuous use.
- For unattended record/playback of material that is longer than one side of a tape, there are two features that spare you from constantly attending to the deck:

—Auto Reverse mode plays or records in both directions before stopping, switching sides on the fly.
—Continuous Reverse mode allows you to loop the tape during; layback up to 5 times, or record in both directions, without pausing to flip the tape and re-engage the record mechanism. Bothfeatures are accessible from the front panel, with one-button selection.

122R MKIII

3-Head Stereo Cassette Deck



The standard for production and broadcast facilities, the 122 MKIII features smooth faultless tape handling mechanisms, a three head transport with high-performance Cobalt Amorphous record/playback heads and precision servo direct-drive capstan motors.

All the features of the 112R MK II (no reverse of course) *plus*—
- XLR balanced and unbalanced RCA inputs and outputs are selectable with the flip of a back-panel switch. There are 1/4-inch inputs on the front panel for simple and direct plug-in of line-level gear
- MPX filter button eliminates polot and sub carrier broadcast tones that can interfere with Dolby noise reduction
- Bias and level fine tuning for each channel. These tuners can be used in conjunction with the one-touch 400 Hz or 10 kHz oscillator adjustment signals to get proper VU calibration before or during each recording session.
- Record/mute autospacer automatically inserts 4 sec. of silence between songs or broadcast segments for pro quality tapes

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MDX 1200 Autocom

- Attack and release times, with Intelligent Program Detection, prevents common adjustment errors.
- Newly-developed, powerful noise gate.
- Switchable soft knee/hard knee characteristics for varied sound pressure levels.
- Bright, illuminated LEDs show gain reduction.

MDX 2100 Composer

- Integrated auto/manual compressor, expander & peak limiter.
- Compresses "musically" in dynamic range without any audible "pumping" or "breathing".
- Attack & release times are controlled automatically or manually.
- Interactive Gain Control (IGC) combines a clipper and peak limiter for distortion-free limitation on signal peaks.
- Servo-balanced inputs and outputs are switchable between +4dB and -10dB.

ALESIS

3630 Compressor

The 3630 provides two full-featured professional compressor/limiters in one rack space. Ideal for any application from studio recording and mixing to live sound reinforcement and broadcast.

- Dual mono or linkable true stereo operation,
- Choose between RMS and peak compression styles as well as hard knee /soft knee characteristics.
- Dual 12-segment LEDs display gain reduction and input/output levels.
- Each channel's built-in noise gate has an adjustable threshold and close rate to ensure clean, transparent performance.
- Variable attack and release times and a sidechain function for "ducking" in broadcast applications.

t.c.electronic

Wizard M2000

Studio Effects Processor

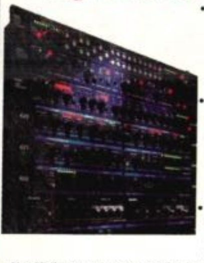
The M2000 features a "Dual Engine" architecture that permits multiple effects and six different routing modes. There are 250 factory programs including reverb, pitch delay, delay, chorus, flang, phase, ambience, EQ, de-essing, compression, limiting, expansion, gating and stereo enhancement. The M2000 also features 20-bit analog conversion,AES/EBU and S/PDIF digital inputs/outputs, "Wizard" help menus, 16-bit dithering tools, Tap and MIDI tempo modes and single page parameter editing.

- The array of enhanced pitch shift (up to 8 voices), chorus, and delay effects are characterized by their precision and versatility. Everything from the fine and subtle to the wide and spectacular is handled with equal superiority. The algorithms in the dynamics section (compressor, limiter, expander, gate and de-esser) are unique as stand-alone effects, but are particularly useful in combination with other effects. Those might be de-esser/room, gated hall or compressed pitch. The possibilities are endless.
- Tempo Tap function lets you match effects to the beat. Tempo can be adjusted in beats-per-minute and sub-divided any way you like–even in triplets. The tempo can also be read from MIDI.
- Preset "Gilding" (morphing) function ensures seamless transition between effects. Very useful in live and mixing situations.

Symetrix

601

Digital Voice Processor



- Accepts mic or line level analog signals, converts them to 18 bit-digital and then performs 24-bit digital domain signal processing.
- Processing includes fully parametric/shelving EQ, notch/dynamic filtering de-essing, delay, chorus, gating, expansion, compression, AGC and DC removal.
- Combination of 128 factory presets and 128 non-volatile user programs.
- Has XLR-balanced mic and line inputs, XLR-balanced stereo output. Digital XLR-balanced and S/PDIF (RCA) inputs and outputs. MIDI input/output supports connection to virtually any type of MIDI control device for programming or controlling the 601 in real time.
- Ideal for a variety of recording, broadcast, live sound, and post production applications.

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FOSTEX

XR-5/XR-7 Multitrackers

XR-5 Features:

- High-speed (3-3/4 ips) four-track (2-tracks simultaneously) recorder with built-in Dolby noise reduction (can be turned off)
- Pitch controller varies the tape speed within a range of ±12%
- Punch in/out function makes corrections and phrase insertions when necessary, can be done easily with optional footswitch.
- Four inputs accommodate two microphones in channels one and two. Has convenient insert points for connecting a compressor/limiter and other devices for the mic channels.
- Each channel is equipped with two-point high/low shelving equalizers to help shape the sound, and an AUX send function for processing anbient system effects.
- Trim function lets you switch High/Mid/Low input levels for channels one and two.
- Alternate Mix mode lets you independently select the signal from the input jack or the tape playback. Prefader effect send, inline monitor & other functions are also possible using this mode.
- Post foldback (monitor) send function routes the foldback signal to the AUX send. When the foldback is activated you can actually mixdown at the same time you add reverb to a tape

- MIDI/TAPE multi-mix mode supports MIDI synchronization. Together with the Alternate Mix mode the XR-5 can simultaniously mix all MIDI sound source output with tape playback sound and effect output while monitoring!

The XR-7 has all the features of the XR-5 *plus*—

- 6 inputs, plus the ability to record four tracks simultaneously
- Dolby C noise reduction plus dual speed recording
- During recording, Channels 5 and 6 are the primary inputs for microphones and acoustic instruments. They have trim controls and mid-sweep EQ. During mixdown, these channels act as the main stereo L/R bus.
- Auto rehearsal mode let's you concentrate on the music instead of the machine.

TASCAM

PORTA 03 MKII Ministudio

The easiest way to get into multitrack recording, the PORTA 03 is an extremely economical 4-track recorder that lets you overdub as well as mixdown to standard cassettes.

- 4-track recorder with integrated two channel mixer
- Two 1/4-inch MIC/LINE inputs with trim control
- Extended dynamic range with Dolby B noise reduction
- 3-digit tape counter keeps track where you are on the tape
- Master level control for the entire mix, and the level sent to LINE OUT for stereo mixdown
- Track selector indicates which of the 4 tracks you're recording to

- SAFE selection keeps you from inadvertently recording over tracks you've recorded earlier
- Headphone jack for comfortable monitoring
- RCA output jacks for mixdown to cassette

PORTA 07 Ministudio

The PORTA 07 packs high-end features into a compact and economical package. Achieves great sound with high speed tape transport, high-low EQ and DBX noise reduction.

- 4-track recorder with integrated four channel mixer
- Two 1/4-inch LINE inputs and two 1/4-inch MIC/LINE inputs with trim control.
- Separate high and low EQ for each track provides 10dB of boost or cut.
- dbx noise reduction for improved signal-to -noise ratio.
- Punch-in/out r manually or with optional RC-30 footswitch.
- Effects send with stereo return can be applied in varying amounts to all four channels

- "Bounce or "ping pong" a submix of multiple mono or stereo tracks onto a single empty track, leaving the original submix tracks free to overdub new material onto. You can even add a "live" track to the submix while you're bouncing down, to squeeze in yet another track.

424 MKII Portastudio

The 424 is premium Portastudio that takes multitrack recording to the next level. Features superior audio quality, balanced XLR inputs, enhanced equalization and a big-studio style AUX section.

All the features of the PORTA 07 *plus*—

- 4-track recorder with 8-input mixer (4 mono MIC/LINE inputs with 1/4-inch and balanced XLR jacks and 2 stereo inputs with 1/4" jacks.)
- Separate 3-band EQ section for each of the four mono channels with 10dB of boost or cut and sweepable midrange.
- Auto Punch in/out with rehearsal, plus a Repeat switch lets you set up a tape loop that goes over the same area of a tape while you practice your punch-in/out and overdub moves—without committing a single note to tape
- Two independent dedicated AUX sends let you use more effects or use one as tape cue during tracking

- Dual-speeds, logic-controlled tape transport system improves tape handling and sound quality. Select 3-3/4 inch per second HIGH speed for the best possible recording quality or NORMAL 1-7/8 ips speed.
- Monitor output makes it easy to connect an external monitor amplifier without repatching—at mixdown.
- Tape DIRECT OUTS are provided for integration with external mixers.

MIDI Musicians Take Note—If you've got MIDI keyboards, drum machines and sound modules in your set up, you can exploit the power of :virtual tracking" with either the PORTA 07 or 424/464/488 Portastudio. You can use a MIDI synchronizer like the Tascam MTS-30 MIDI-Tape Synchronizer to record (stripe) a code onto track 4 (track 8 with the 488). Just select SYNC mode on the DBX switch and record the tone to tape. After striping the tape with FSK or Song Position Pointer information, all your MIDI instruments will faithfully follow the tape during playback and recording, even if you slow or speed the tape ssing the PITCH controls. The big benefit is that your MIDI tracks (called virtual tracks) don't actually have to be recorded until final mixdown, giving you lots more unused tracks to record on.

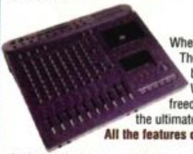
464 Portastudio

The functionality of a pro recording studio in a small, lightweight package, the 464 Portastudio is a full-featured eight input, four-track cassette recorder complete with a 12x2 internal mixer and dual buss design that lets you create separate recording and cue mixes.

All the features of the 424 MK II *plus*—

- 4-track recorder with 12-input mixer (4 mono MIC/LINE with 1/4-inch and balanced XLR jacks, 4 stereo 1/4" jack pairs.
- Channels 1-4 offer High and Low shelving EQs and a sweepable Mid EQ. Tracks 5-6 and 6-7 have shelving EQ only, while 9-10 , 11-12 are best used with input that has its own internal EQ..

488 MKII Portastudio



When 4 tracks are just not enough, then you need the perfect creative tool—the 488 MKII Portastudio. The most cost-effective 8-track recorder on the market, the 488 not only offers additional capacity but versatile capability and intuitive operation for easy capturing & manipulation of your ideas. Whether recording acoustic or electronic instruments or vocals, the 488 offers maximum creative freedom to produce your best work. With all the functionality of a professional studio, the 488 may be the ultimate demo recording machine.

All the features of the 464 MK II *plus*—

- Includes phantom power for use with high-quality condenser microphones..
- Built-in mixer features low-noise circuitry, with 12 inputs and 2 group busses. There is a separate input for your stereo master recorder.
- Each of the 8 main input channels includes individual 3-band equalizers. You get Hi and Low shelving EQs, plus a semi-parametric sweepable midrange EQ.
- Unique multi-mix mode with the capability of handling up to 20 inputs at mixdown.
- The only 8-track cassette that offers a servo controlled tape transport complete with electronic braking. Equipped with a high-performance Hysteresis Tension Servo Controlled (HTSC) tape transport, the 488 delivers better sound than the first 8-track reel-to-reel machines.
- HTSC maintains precise and consistent tape tension from the beginning until the end of the tape.It actually dynamically adjusts the back tension on the tape as it moves from one end to the other, allowing precise locating capability.

ALESIS

Monitor One

Near Field Studio Reference Monitor

Designed by engineers with decades of experience, the award winning Monitor One provides the last critical link in the recording studio's signal chain; giving you an accurate reproduction of what is being recorded.

- Delivers excellent image and transient reproduction, powerful bass, and smooth, extended high frequency detail.
- Exclusive SuperPort speaker venting technology eliminates the "choking" effect of port turbulence for solid high-power bass transients and extended low frequency response.
- Ferrofluid cooled 1" silk-dome driver eliminates the harshness and ear fatigue associated with metal or plastic tweeters, making it easy to mix on for extended periods.
- Monitor One's powerful bass incorporates a proprietary 6.5" low frequency driver with a mineral-filled polypropylene cone and a 1.5" voice coil wound on a high-temperature Kapton former.
- They come in a mirror-image left/right pair covered with a non-slip rubber textured laminate for stable mounting.

Monitor Two

Mid Field Studio Reference Monitor

With much of today's popular music demanding more bass at louder volumes than a small near field monitor can possibly produce—the Monitor Two delivers—at a price no higher than many of these smaller speakers.

- Utilizes a 10" three way speaker design with a unique asymmetrical crossover to maintain the same accurate tonal balance and imaging of the Monitor One—but with a much larger sound field.
- 10" low frequency driver incorporates Alesis' SuperPort speaker technology to provide powerful, extended bass.
- 5" mid frequency driver offers exceptional mid frequency detail
- 1" silk dome high frequency driver delivers a broad but natural frequency response from 40Hz to 18kHz.
- Covered in a non-slip rubber finish, the Monitor Two comes in a mirror imaged pair for mixing accuracy.

TANNOY®

PBM Series II

Reference Monitors

The PBM II Series is the industry standard for reference monitors. They feature advanced technologies such as variable thickness, injection molded cones with nitrite rubber surrounds and the highest quality components including polypropylene capacitors and carefully selected indicators. With a Tannoy monitor system you are assured of absolute fidelity to the source, true dynamic capability and most important, real world accuracy.

PBM 5 II

- Custom 5" injection-molded bass driver with a nitrite rubber surround for extended linearity and accurate low frequency reproduction. They are better damped for reduced distortion and exhibit more naturally open and detailed midrange.
- Woofer blends seamlessly with the ¾" polymide soft dome ferro-fluid cooled tweeter providing extended bandwidth for extremely precise sonically-balanced monitoring.
- Designed for nearfield use, the PBM 5 II cabinets are produced from high density medite for minimal resonance and features an anti-diffraction radiused front baffle design.

PBM 6.5 II

- Transportable and extremely powerful, the PBM 6.5 II is the ideal monitor for almost any project production environment.
- 6.5" lowfrequency driver and 3/4" tweeter are fed by a completely redesigned hardwired hand selected crossover providing uncompromised detail, precise spectral resolution and flat response.
- Fully radiused and ported cabinet design reduces resonance and diffraction while providing deep linear extended bass.

PBM 8 II

- High tech 1" soft dome tweeter with unmatched pattern control and enormous dynamic capability. 8" driver is capable of powerful bass extension under extreme SPL demands.
- Hard wired crossover features true bi-wire capability and utilizes the finest high power polypropylene capacitors and components available.
- Full cross-braced matrix medite structure virtually eliminates cabinet resonance as a factor.
- Ensures precise low frequency tuning by incorporating a large diameter port featuring laminar air flow at higher port velocities.

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CARVER

CA-400/CA-900

Stereo Power Amplifiers

Designed from the ground up for fixed installation applications, the CA-400 and CA-900 are manufactured under the most stringent quality control procedures and are backed up with a full five year warranty covering all parts and labor.

- 3-position barrier strip screw terminal inputs can be used with balanced or unbalanced lines
- Independent CH 1 & CH 2 level controls with 11 detented positions.
- Dual mono mode for operating both channels with a single mono input.
- Bridged mono mode for combining the power of both channels into a single higher powered channel.
- Internally configurable for parallel mono mode, for single channel low impedance operation.
- Internal jumpers to bypass Left and Rght Level Controls.
- Internal connection points for add-on accessories like the optional Balanced Transformer Kit.
- Independent CH 1 and CH 2 speaker relays will instantaneously disconnect if fault conditions such as over temperature, short circuit or D.C. offset is detected.
- Power Ready, Signal Present and Clip/Protect indicators

CA-400 features: 130W per channel into 8 ohms,
200W per channel into 4 ohms.

CA-900 features :325W per channel into 8 ohms,
450W per channel into 4 ohms.

Stewart

Power Amplifiers

PA-1000

PA-1400

PA-1800

- High frequency switch mode power supply fully charges 120,000 times per second (1000 times faster than most power supplies) requiring far less capacitance for filtering and storage.
- High speed recharging also reduces power supply "sagging" that afflicts other designs.
- Incredibly efficient, 5 PA-1000 or PA-1400's (4 PA-1800's) can be run on one standard 20 amp circuit. No need for staggered turn-on configurations or other preventive measures when using multiple amp set-ups
- They produce smooth and uncolored sound, while offering very full detailed low end response and tons of horsepower.
- Each amp carries a full 5 year warranty on parts and labor

PA-1000 weighs 9 lbs, is 15" deep and occupies one standard rack space. Delivers 1000 watts into 4Ω when bridged to mono.

PA-1400 weighs 16 lbs, is 15" deep and takes 2 standard rack spaces. Delivers 1400 watts into 4Ω when bridged to mono.

PA-1800 weighs 17 lbs, is 17" deep and takes two rack spaces. Delivers 1800 watts into 4Ω when bridged to mono.

BGW

Performance Series Amplifiers

Performance Series 1

300 Watt Power Amplifier

- Measuring only 3.5 inches high and weighing 26 pounds, the Series 1 delivers more than 150 watts per channel.
- Its welded steel chassis is unbelievably strong while a custom heat sink extension provides exceptional thermal capacity
- An internal fan provides quiet background noise levels for critical monitoring applications and when pushed hard the cooling system insures continuous cool operation even in the most demanding situations.
- Active balanced inputs with both XLR and 1/4" phone jacks.
- Supplied with quality 5-way binding posts for highly reliable speaker connection.
- Front panel handles are reversible for either rack mount installation or easy handling.
- LEDs are provided for signal presence and clip indication; the detented gain controls have large knobs for easy front panel adjustments.

Performance Series 2

600-Watt Power Amplifier

- Same as above except the Series 2 weighs 32 pounds and delivers more than 300 watts per channel.

Performance Series 4

1200-Watt Power Amplifier

- Same as above except the Series 4 weighs 53 pounds and delivers more than 600 watts per channel.
- Has a switch selectable clipping eliminator that prevents damage to the speakers.

SAMSON® MIXPAD 9

Ultra-Compact 9-Channel Audio Mixer

A remarkably compact 9-channel mixer, the MIXPAD 9 offers professional audio performance and a wide range of user-intensive features. It boasts low noise and distortion specifications, includes wide-range gain trim controls for both mic and line inputs and provides exceptionally low group delay over the full frequency bandwidth for a more transparent, open sound. It also has a very high slew rate—usually found only on larger, more expensive mixing consoles—allowing it to react very quickly to transients and maintain a crisp, articulate sound. It offers phantom power (48v) for use with condenser microphones and an in-line power supply eliminates magnetically-induced hum.

- •3 mic/line inputs and 3 stereo channels (total 9 inputs).
- •2 auxiliary sends for effects and two Stereo returns.
- •Independent 2-band shelved EQ, pan control for mono channels and balance control for stereo channels.
- •Adjustable mic input trims allow use with a wide variety of mics.
- •Phantom powered XLR mic input connectors.
- •Peak LEDs for left and right main outputs.
- •Extremely durable, extruded aluminum chassis.

MACKIE.

MICRO SERIES 1202-VLZ

12-Channel Ultra-Compact Mic/Line Mixer

Usually the performance and durability of smaller mixers drops in direct proportion to their price. Fortunately, Mackie's fanatical approach to pro sound engineering has resulted in the Micro Series 1202-VLZ, an affordable small mixer with studio specifications and rugged construction. It delivers no-compromise, non-stop, 24-hour-a-day professional duty in permanent PA applications, TV and radio stations, broadcast studios and editing suites—where nothing must ever go wrong.

- Working S/N ratio of 90dB, distortion below 0.025% across the entire audio spectrum and +28 dB balanced line drivers.
- 4 mono channels with discrete, balanced balanced mic/line inputs and 4 stereo channels (12 inputs total).
- Line inputs and outputs work with any line level, from instrument level, to semi-pro -10dB, to professional +4dB.
- Switchable phantom-powered (48v) inputs for condenser mics.
- Every input channel has a gain control, pan pot, low EQ at 80 Hz, high EQ at 12.5 kHz and two aux sends with 20dB gain.
- Master section includes two stereo returns, headphone level control and metering.
- Sealed rotary pots resist and other contaminants.

NEW! MS1402-VLZ

14 x 2 Compact Mic/Line Mixer

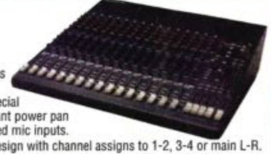
Mackie's fanatical engineers have done it again. Balanced inputs and outputs, 3-band EQ, AFL/PFL and deluxe tape monitor/Control Room feature Nice long 60mm faders, six studio-quality mic preamps and extra Alt 3-4 stereo bus—in less than 1.3 square feet of space.

- Studio grade mic preamps (chs. 1-6) with high headroom, low noise and phantom power. Also incorporate low cut filters to cut mic handling thumps, pops and wind noise. Lets you safely use low shelving EQ on vocals.
- Trim controls (ch. 1-6) with ultra wide range (+10 to -40dB) handle everything from hot digital multitrack feeds to whispering lead singers and older, low output keyboards.
- Pan control with constant loudness and high L/R attenuation so you can pan hard left or right without bleed-through.
- Two aux sends per channel with 15dB extra gain above Unity.
- 60mm log-taper faders are accurate along their whole length of travel and employ a new long-wearing contact material for longer fader life & uper resistance to dust, smoke etc.
- Control room/phone matrix adds incredible tape monitoring, mixdown and live sound versatilit y.
- Mute switch routes channel output to extra ALT 3-4 stereo bus. Use if for feeding multitrack recorder channels, creating a subgroup via controlroom/phones matrix, monitoring a signal before bringing it into the main mix or creating a " mix minus".
- Solid steel chassis instead of aluminum or plastic.

The new MS-1202, 1402 and 1604 all include VLZ (Very Low Impedance) circuitry at critical signal path points. Developed for Mackie's acclaimed 8•Bus console series, VLZ effectively reduces thermal noise and minimizes crosstalk by raising current and decreasing resistance.

NEW! CR-1604 VLZ

16-Channel Mic-Line Mixer



The hands-down choice for major touring groups, studio session players, as well as broadcast and sound contracting.The new CR-1604 VLZ features everything you would expect from a larger console, and then some! 24 usable line inputs with special headroom/ ultra-low noise Unityplus circuitry, seven AUX sends, 3-bandEQ, constant power pan controls, 10-segment LED output metering and discrete front end phantom-powered mic inputs.

- Lowest noise and highest headroom (90 dB working S/N and 108 dB dynamic range). Many drummers consider it the only mixer capable of handling the attack and transients of acoustic and electronic drums.
- Genuine studio-grade phantom powered, balanced input mic preamps on channels 1-6. All CR-1604 VLZ (and optional XLR10 for ten more) discrete input mic preamp stages incorporate four conjugate-pair, large-emitter geometry transistors. So, whether recording nature sound effects or heavy metal, miking flutes or kick drums, you get the quietest, cleanest results possible.
- True 4-bus design with channel assigns to 1-2, 3-4 or main L-R.
- 3-band EQ with mid-frequency sweep and low cut switch.
- AFL/PFL solo and mute switches with overload andsignal present indicators.
- Rear panel features include insert points and 1/4-inch /XLR connectors on every channel, as well as RCA tape inputs/outputs.
- New, standard size channel trim pots are found at the top of each channel.
- Rotary input/output "pod" allowing three different positions for set-up.

TASCAM

M2600 MKII Series NEW!

16/24/32-Channel 8-Bus Mixers

LOW NOISE CIRCUITRY

- Combining completely redesigned low noise circuitry with Absolute Sound Transparency™ the M-2600 delivers high-quality, extremely clean sound. No matter how many times your signal goes through the M-2600, it won't be colored or altered. The signal remains as close to the original as possible. The only coloring you hear is what you add with creative EQ and your outboard signal processing gear.
- Double reinforced grounding system eliminates any hum. World-class power supply provides higher voltage output for better headroom and higher S/N ratio.

PREMIUM QUALITY MIC PRE-AMPS

- The M-2600's mic pre-amps yield an extremely low noise floor, enormous headroom and an extremely flat frequency response. It also increases gain control to an amazing 51dB. Plus, you get phantom power on each channel.
- Accepts balanced or unbalanced 1/4" inputs, and low-impedance XLR jacks. Better still, the TRIM controls operate over a 51dB input range. For the hottest incoming signals, all it takes is a press of the -20 dB PAD button atop each channel strip to bring any signal down to manageable levels. Plug in anything – keyboards, guitars, basses, active or passive microphones, samplers and more.

THE BEST AUX SECTION IN THE BUSINESS

Versatile AUX section has 8 sends total, 2 in stereo. Send signal in stereo or mono, pre-or post-fader. Available all at once. Return signal through any of 6 stereo paths.

FLEXIBLE EQ SECTION

Bi-directional split EQ means you can use either or both EQ sections in the Monitor or Channel path...or defeat the effect altogether with one bypass button. Other comparably priced mixers will lock the shelving mix into the Monitor path only, limiting your EQ application.

ADVANCED SIGNAL ROUTING OPTIONS

Direct channel input switching. Assign to one of eight busses, direct to tape or disk, or to the master stereo bus. Because the group and direct-out jacks are one and the same, you can select either without repatching.

ERGONOMIC DESIGN

The M-2600 has a big studio feel. All buttons are tightly spring loaded, lock into place and accomodate even the biggest fingers. The faders and knobs have a tight, smooth "expensive" feel and are easy to see, reach and manipulate. Center detents assure zero positions for EQ and PAN knobs. Smooth long throw 100mm faders glide nicely yet allow you to position them securely without fear of accidentally slipping to another position.

Panasonic.

SV-3800/SV-4100

Professional DAT Recorders

Designed for professional applications, the SV-3800/SV-4100 have highly accurate and reliable transport systems with search speeds up to 400X normal, and 20-bit D/A converters to satisfiy the highest professional expectations both in terms of sound and functionality.

SV-3800 Features:

- Recording via analog inputs offers sampling rates of 44.1 or 48kHz. When recording through digital inputs, it automatically clocks to incoming frequencies of 32/44.1 or 48kHz.
- XLR-balanced digital inputs/outputs plus consumer format coaxial and optical inputs/outputs. XLR-balanced analog stereo inputs/outputs. Output level is selectable between +4db and -10db. The input level is +4db
- Built-in shuttle wheel has two variable speed ranges: 3 to 15x in Play mode and 1/2 to 3x normal speed in Pause mode .
- High speed transport enables searching up to 250x normal speed. Search up to 400x normal speed is possible once the tape has been scanned in Play, FF or REV mode. This ensures access to any point on a two-hour DAT in under 30 seconds.
- Ramped record mute and unmute with three seconds fade-in and five seconds fade-out provides automatic level changes at the start and end of a recording.
- Comprehensive display includes program numbers, absolute time, program time, remaining time and Table of Contents.

SV-4100 Has all the features of the SV-3800 Plus—:

Offers enhanced performance required for professional production, broadcast and live-sound systems. Features such as instant start, external sync capability and enhanced system diagnostics make the SV-4100 the DAT quality standard.

FOSTEX

D-5

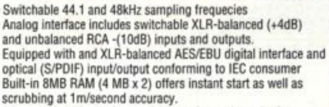
Digital Master Recorder

With professional features and a consumer price tag, the D-5 satisfies a lot of requirements. It records or playsback four hours of music, includes optical and digital input/output, and TOC functions that are as easy to use as a CD player. It's also equipped with basic pro features such as ID editing function, GPI and XLR connectors and 300X speed locate and search functions.

- Playback/record audio with32/44.1/48 kHz sampling in SP (standard play) mode. Equipped with LP (long play) mode, it can play/record at 32 kHz up to 4 hrs. on a 120 minute cassette.
- Analog interface includes switchable (+4dB/-10dB) balanced and unbalanced XLR inputs and outputs.
- AES/EBU digital interface (XLR) for professional use and optical (S/PDIF) input/output for consumer/semi-pro connections.
- 5-pin GPI input connector allows. Play, Stop & S-ID search to be implemented through commands from an external source.
- Records CD-Q code sync ID, enabling precise music start up. When performing digital signal transfer from CD through it's optical input, the D5 precisely records S-IDs according to the track number and index information of the CD-Q code. So even if there is a break in the middle of a song or there isn't a non-recorded section between two songs, you can locate to the S-ID location (eg. beginning of song) precisely.

D-10

Digital Master Recorder



- Switchable 44.1 and 48kHz sampling frequecies
- Analog interface includes switchable XLR-balanced (+4dB) and unbalanced RCA -(10dB) inputs and outputs.
- Equipped with and XLR-balanced AES/EBU digital interface and optical (S/PDIF) input/output conforming to IEC consumer
- Built-in 8MB RAM (4 MB x 2) offers instant start as well as scrubbing at 1m/second accuracy.
- Advanced jog/shuttle for precision cueing and monitoring.
- Auto Cue provides automatic locating to the exact start of audio modulation during ID search and tape loading.
- Universal GPI input/output enables easy and fast assemble editing, based on A-time between a pair of D-10s.
- Switchable 2-position reference level: -12dB/-20dB.
- Start and Skip IDs as well as up to 799 P-NOs can be recorded and played back.
- 10-digit key-pad lets you store and recall 100 cue points
- Continuous or peak reading level meters can display available headroom with an accuracy of ±0.1dB.
- Reads and displays A-time or Pro R-time, also provides PCM monitoring.
- Optional 8333 interface card adds timecode and RS-422 (X 2) functionality to the D-10:

–Reads an external timecode and records on the sub-code area
–Reproduces and outputs the timecode from sub-code area
–Switchable RS-422 and ESbus protocols. Using the ESbus, up to 16 D-10s can be daisy chained.

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TASCAM
DA-P1 Portable DAT Recorder

- Rotary two head design and two direct drive motors for the best transport in its class.
- XLR-balanced mic/line inputs (with phantom power) acceptf signal levels from -60dB to +4dB.
- Analog line inputs & outputs (unbalanced) plus S/PDIF (RCA) digital inputs and outputs enable direct digital transfers.
- Uses next generation A/D & D/A converters for amazing quality.
- Supports 32/44.1/48kHz sample rates & SCMS-free recording.
- Included in its design is a MIC limiter and 20dB pad to achieve the best possible sound without outside disturbances.
- TRS jack & level control to monitor sound with any headphones.
- Built tough, the DA-P1 is housed in a solid, well-constructed hard case. It includes a shoulder belt, AC adapter & 1 battery.

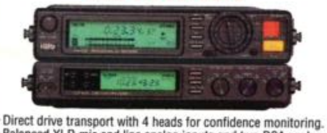
SONY
TCD-D8
DAT Walkman Player/Recorder

- Long Play (LP) mode allows 4 hours of record/playback of 12-bit audio on a single DAT cassette.
- Equipped with digital coaxial and optical input connector. Also has analog Mic and Line inputs.
- High-speed Automatic Music Sensor search function finds & plays tracks, skips forward or back up to 99 tracks, all at 100x normal speed.
- Digital Volume Limiter System increases listening comfort & sound quality by automatically adjusting for sudden level changes.
- Two-speed cue-review lets you hear sound while player is in fast-wind modes, up to 3x or 25x normal speed.
- LCD display with backlit windows clearly shows recording level, track number, operating status and 4-segment battery indicator, even in low ambient light conditions.
- Optional RM-D3K System Adapter Kit for complete digital interface. It has input/output connectors for both the optical cable & the coaxial cable. Also includes a wireless remote control.

TCD-D10 PRO II
Portable DAT Recorder

- Has balanced XLR input, switchable mic (-60dB) or line (+4dB) inputs. A 12-pin digital connector provides interfacing with AES/EBU digital signals of 32/44.1/48.0 kHz sampling rates.
- Comprehensive self-diagnostics function constantly monitors the rotation of the head drum, capstan and reels. The tape transport mode and load/unload time are continuously checked as well.
- Up to 99 start IDs can be recorded in the subcode area. When the record button is pressed, the start ID is recorded automatically for 9 seconds. During recording, it can also be added manually to any position of the tape. Search for start IDs is 100X normal speed.
- 20-segment digital peak level meters include overload indicators. Closely tracks input signal for accurate level indications.
- During playback, the date and time of recording is displayed.
- Has a record-level limiter with a fast attack time of 300ms. Mic attenuator prevents distortion by suppressing signal level 20 dB.
- Immediate playback is possible through a built-in speaker.
- Supplied wired remote controller also accepts a mic holder. Two mic stand screw adapters are also supplied.
- Supplied NP-22H rechargeable battery provides 1.5 hours of operation. Optional NPA-D10 battery adapter enables 1 hour on AA batt. Supplied ACP-88 AC adapter operates on 100-240v 50/60 Hz.

HHb
PORTADAT
PDR1000/PDR1000TC
Professional Portable DAT Recorders

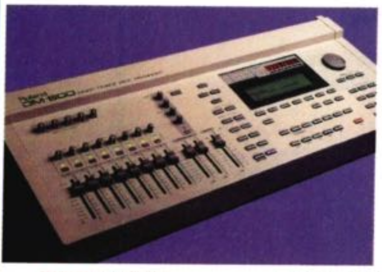


- Direct drive transport with 4 heads for confidence monitoring.
- Balanced XLR mic and line analog inputs and two RCA analog line outputs. Digital inputs and outputs include S/PDIF consumer (RCA) and AES/EBU balanced XLR
- Left/Right channel mic input attenuation selector(0dB/-30dB)
- 48v phantom power, built-in limiter & internal monitor speaker.
- Illuminated LCD display shows clock and counter, peak level metering, margin display, battery status, ID number, tape source status and machine status.
- Supplied Nickel Metal Hydride rechargeable battery powers the PDR1000 for two hours. The battery has no "memory effect" and is charged in two hours with the supplied AC Adapter/charger.

PDR1000TC Additional Features:
In addition to all the features of the PDR1000 recorder, the PDR1000TC is equipped to record, generate and reference to time code in all existing international standards.

- All standard SMPTE/EBU time codes are supported, including 24, 25, 29.97 (drop frame and non-drop frame) and 30 fps.
- External syncronization to video, field sync and word sync.

Roland® DM-800
Digital Audio Workstation



The DM-800 is a compact, stand-alone multi-track disk recorder that provides an amazing array of features at an unbelievably low price. Whether for music production, post production or broadcast, the DM-800 will make your work simpler, faster, more productive and more profitable. A full function workstation, the DM-800 performs all digital mixing operations from audio recording, to editing, to track-bouncing, to final mixdown. It fully supports SMPTE and MIDI time codes and also features a built-in Sample Rate Resolver to synchronously lock to any time code.

POWERFUL EDITING
- Time compression, pitch compression
- Completely non-destructive cutting, erasing, copying
- Very fast looping for music or ambiance editing
- Scrub preview and preview to, from and thru
- Six levels of waveform zoom
- Optional RS-422 interface (D10-800D) for 9-pin control from video editor

FLEXIBLE I/O STRUCTURE
- Full digital patch bay
- Stereo AUX send buss
- Two stereo AUX returns
- Direct channel outs
- Digital stereo input and two digital stereo outputs
- Four balanced analog inputs with gain controls and four balanced analog outputs with option for 4 more

FULL AUTOMATION
- Dynamic and snapshot automation of level, pan, 2-band EQ, including frequency select, boost and cut
- Microscope editing of automation data
- Phase level editing of level, crossfade and fade in/out

TRIGGER FEATURES:
- Trigger mode to play any combination of 8 tracks for vocal fly ins or sound effects placements
- Advanced trigger mode for live operation with preset or dial up cue of phrases to be played one after another

MIDI FEATURES:
- MIDI machine control
- Internal tempo maps
- Accurate editing by bars and beats sub-beats
- MIDI clock and song position pointer output
- 8 MIDI triggers for instant phrase playback
- MIDI trigger of record and punch in/out
- Tempo maps from external sequences, MIDI or tap input.

ACCURATE SYNCHRONIZATION
- Frame accurate sync to any time code
- Locks to MTC
- Generates and reads all types of SMPTE, including 24.25, 29.97 (Drop/non-drop) and 30 frames per second
- Incoming SMPTE reshaped to output jack

RECORDING OPTIONS
- Records to standard SCSI hard drives
- Up to 24 hours recording time possible
- Uses Magneto Optical or Syquest drives for fast project changeovers
- Optional internal 2.5" Drives for portable operation

PROJECT CATALOGING
- Up to 150 projects on line at once
- Easy cataloging of sound effects and projects
- Easy transfer of sounds from one project to another
- File compatible with DM-80

HIGH QUALITY SOUND
- Sampling rates of 48/44.1/32 kHz
- 18-Bit A/D and D/A with 128 and 8 times oversampling
- 24-bit internal processing

VIDEO OUT
- Composite, S-video, digital RGB output
- All track overview with infinite level of project zoom
- Views of phrase and waveform editing
- Very accurate level mMeters
- Track status and time location

ALESIS adat xt
8-Track Digital Audio Recorder

An incredibly affordable tool, the new ADAT-XT sets the standard in modular digital multitrack recording. With new features & enhanced capabilities, the ADAT-XT operates up to four times faster than the original ADAT, offers an intelligent software-controlled tape transport and provides onboard digital editing and flexible autolocation.

Stunning Audio:
- Incorporates ultra-high fidelity 18-bit, 128 X oversampling A/D converters which provide better-than-CD audio quality.
- For outputs, the D/A converters provide 20-bit, 8x oversampling performance for a flatter frequency spectrum, improved phase response and much less low-amplitude distortion.
- Frequency response is 20 Hz to 20kHz ±0.5dB, S/N ratio is greater than 92dB, crosstalk between channels is better than -90dB @ 1kHz.

Flexible Inputs and Outputs:
- Servo-balanced 56-pin ELCO connector operates at +4dB for interfacing with consoles with +4 dB balanced/unbalanced inputs/outputs.
- Also includes unbalanced -10dB inputs/outputs (phono connectors).
- Has an electronic patch bay built-in so it can be used with stereo and 4-bus consoles.
- Multiple Optical Digital I/O can carry up to eight tracks at once completely in the digital domain. The digital I/O combined with the ADAT Synchronization Interface make it completely compatible with any ADAT-format recorder or other devices that use Alesis' proprietary digital protocol.

Digital Editor:
- Make flawless copy/paste digital edits between machines or even within a single unit. A new Track Copy feature allows you to make a digital clone of any track (or group of tracks) and copy it to any other track (or group) on the same recorder. This allows you to assemble composite tracks for digital editing.
- Use two or more ADAT-XTs and the Tape Offset feature lets you copy and paste not only from track to track, but from location to location. Tape Offset assembles the elements of a project with a minimum of repetitive over dubbing. It changes the relative tape position of a slave XT to its master, so you can "fly" audio to different locations on each tape.
- Track Delay feature allows you to delay the time reference of a track by up to 170ms. With Track Delay, you can easily change the groove of a tune. Track Delay is individually adjustable on each channel and is excellent for fixing slight timing errors in recorded tracks (player lags behind or rushes the beat). In recordings with multiple microphones, you can time-align each track, precisely compensating for the spacing between mics with accuracy to 0.0001 seconds.

Intelligent Transport:
- Rewinds and fast-forwards up to to 4X faster than the original ADAT.
- Advanced transport software continuously monitors autolocation performance and the head constantly reads ADAT's built-in sample-accurate time code—even in fast wind modes.
- Newly developed Dynamic Braking software allows the transport to quickly wind to locate points while taking every precaution to treat the tape gently.

Onboard Autolocator with Auto Record:
- Onboard 10-point autolocate system provides quick access to multiple tape locations. Four specialized locate points make your recording sessions quicker and easier.
- Auto Play automatically enters Play the moment any autolocation point is reached, Auto Return automatically rewinds at the end of a loop.
- Auto Record function lets you automate punch-in/punch-out times that are accurate to 1/100th of a second.
- Rehearse Mode allows you to enter or exit record modes without actually laying tracks to tape.
- To record on the fly, you can even use the individual Record Enable buttons to punch in and out of tracks.
- Includes remote control with transport and locate functions, offers a footswitch jack for hands-free punch-in.

Optional Accessories:
- BRC Master Remote Control lets you command up to 128 tracks from a single location, with 460 nameable locate points, SMPTE & MIDI synchronization & extensive digital editing power.
- AI-1 Digital Interface offers sample rate and digital format conversion between the ADAT-XT's Optical Digital Interface and AES/EBU and S/PDIF formats.
- AI-2 Synchronization Interface allows synchronization to video and film. The AI-2 offers compatibility with video recorders and editing systems (including TimeLine's Lynx-2 system) and can issue MIDI Time Code and translate MIDI Machine Control commands to the ADAT-XT.

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Sabine
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RIP-TIE.
audio accessories
ROLLS
SAMSON®

Digital Multi-Track Recorders
TASCAM

The first thing you notice about the eight channel DA-88 is the size of the cassette - it's a small Hi-8mm video cassette. You'll also notice the recording time - up to 120 minutes. These are just 2 of the advantages of the DA-88's innovative use of 8mm technology.

- The ATF system ensures that there will be no tracking errors or loss of synchronization. The DA-88 doesn't even have (or need) a tracking adjustment. All eight tracks of audio are perfectly synchronized. What's more, this system guarantees perfect tracking and synchronization between all audio tracks on all cascaded decks - whether you have one deck or sixteen (up to 128 tracks!).
- Incoming audio is digitized by the on-board 16-bit D/A at either 44.1 or 48KHz .The frequency response is flat from 20Hz to 20KHz while the dynamic range exceeds 92dB.
- Execute seamless Punch-ins and Punch- outs. This feature offers programmable digital crossfades, as well as the ability to insert new material accurately into tight spots. You can even delay individual tracks, whether you want to generate special effects or compensate for poor timing.

FOSTEX RD-8

Based on the S-VHS format, the RD-8 is designed for the home project or professional recording studio. Features include up to 40 minutes of recording time on a single tape, noiseless punch-in/out , selectable sampling frequencies of 44.1 and 48kHz and pitch and track delay controls. Systems are expandable from 8 to 128 tracks and there are a wide variety of options available.

- Full transport control is available via the RS-422 port, providing full control right from your video bay. The RD-8 records at either 44.1 or 48KHz and will perform Pull-Up and Pull-Down functions for film/video transfers. The Track Slip feature helps maintain perfect sound-to-picture sync and the 8-Channel Optical Digital Interface keeps you in the digital domain.
- The S-VHS transport in the RD-8 was selected because of its proven reliability, rugged construction and superb tape handling capabilities. 8 tracks on S-VHS tape allow much wider track widths than is possible on other digital tape formats.
- With its LCD and 10-digit display panel, the RD-8 is remarkably easy to control. You can readily access 100 locate points, and cross-fade time is fully controllable in machine to machine editing. Table of Contents data can be recorded on tape.
- Since the RD-8 is fully ADAT compliant, your machine can play tapes made on other compatible machines, and can be controlled by other manufacturers ADAT controllers. Your tapes will also be playable on any other ADAT deck.

SONY
PCM-800

Based on the success of Sony's multi-channel DASH-format recorders, the PCM-800 is an affordable and expandable 8-track digital system that employs Hi8 tape technology.

- Combines flawless sound quality, outstanding reliability and professional audio interfacing with AES/EBU digital I/O and XLR analog I/O connections.
- Combines all basic audio functions such as precise auto punch in/out digital cross fade technology, external synchronization with SMPTE/EBU time code and selectable sampling frequencies of 44.1 and 48kHz.
- Also features a shuttle dial for precise tape control, variable speed playback of 6% in 0.1% increments and a flat frequency response from 20Hz to 20kHz.
- Up to 16 PCM-800's can be operated in perfect sync with optional RCC-S1 sync cables, providing up to 128 channels of digital audio recording and reproduction.
- Optional DABK-801 Sync Board provides SMPTE/EBU time code generation and chase synchronization. It can be locked to the incoming time code with subframe accurate offset, which is ideal for audio-follow-video applications.
- The DABK-801 also provides complete video synchronization to external video reference signal.
- Optional RM-D800 provides comprehensive remote control over all functions of the PCM-800. The RM-D800 can control up to six units for up to 48 channels of digital audio.

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1) Your company's primary business activity (check ONE):
01. ☐ Recording studio (including remote trucks)
02. ☐ Independent audio recording or production
03. ☐ Sound reinforcement
04. ☐ Video/film production
05. ☐ Video/film post-production
06. ☐ Broadcast/radio/television
07. ☐ Record company
08. ☐ Record/tape/CD mastering /manufacturing
09. ☐ Equipment manufacturing (incl. rep firm)
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11. ☐ Contractor/installer
12. ☐ Facility design/acoustics
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—FROM PAGE 80, JEFF LYNNE

Lynne: Absolutely. I had used the big orchestras—40-piece with a choir now and again. That was how I had always envisaged it sounding, and once I'd done that, what would it be? Just guitars or something? It had run its course, and I'd had lots of fun doing it, but it becomes a labor after a certain time.

Bonzai: At this stage, do you think of yourself as a producer, a writer, a performer?

Lynne: I like to think of myself as a bit of each, really. I haven't done a lot of performing lately, but I've done a lot of producing. I love to sing as well, and I love to play, so I think of myself as a jack of all trades.

Bonzai: What was your first big production job outside of your own records?

Lynne: My first big one was for George Harrison, *Cloud Nine*. I'd previously done a couple of songs with Dave Edmunds and one night at dinner, he said, "Oh yeah, I forgot to tell you—George Harrison asked me if you'd like to work with him on his new album." I said, "What?!" And it turned out George had been looking for me to hang out with and see what happened. We met and got along really well.

Bonzai: You'd met him before at the *White Album* sessions?

Lynne: Yes, just to shake his hand and say hello. That was all. It was almost 20 years before we met again.

Bonzai: Nice reunion, and the album did quite well.

Lynne: It did fantastically well, and that led to Tom Petty stopping me on the street in Beverly Hills. He was in his car, honked and pulled over to the curb and said, "I've just been listening to George's album, and I love it." Then he asked if I'd fancy working with him. So, a couple of days later I went over to Tom's, and we wrote "Free Falling." That was a good start.

Bonzai: 1989 brought us *Full Moon Fever*...

Lynne: And before that, the Traveling Wilburys, of course. That whole album, and then Roy Orbison, "You Got It" and the *Mystery Girl* album. It was quite a period. I had three albums in the Top Five. It was unbelievable, having not produced anyone but myself before that. I was quite thrilled with it, and, of course, the Wilburys went on to do other things and did really well.

Bonzai: Such great work with the Wilburys—how did things fall together? Did the captain's hat fall on different heads at different times?

Lynne: Oh yeah. Mainly, it came about from an idea when I was working with George. We had hung out well before we started recording, because I suppose George wanted to know how we would get on. I think he just likes to work with people who he likes. Anyway, it turned out we got on great. We had all the same interests and lots of silly things as well. At night, after we'd finish the sessions we'd have a drink and say, "Wouldn't it be great to have a group with anybody we want?" That's how it really came about. George said, "I'll have Bob Dylan," and I said, "Then I'll have Roy Orbison." We'd both known Tom and I had been working with him, and Tom seemed the ideal person, and then it all fitted together.

You can keep laboring on songs, and sometimes you can actually get them better. But usually, a good song is so simple that you don't really have to change anything.

Bonzai: Where did you all end up together?

Lynne: In Encino at Dave Stewart's studio. Actually the first time was at Bob Dylan's studio for "Handle With Care," and then over to Dave Stewart's studio. We literally did a song a day. We'd sit around a table with five rhythm guitars going, and somebody would come up with a riff, we'd all join in and take it from there. We'd come up with a few more ideas, then do the lyrics in the afternoon, early evening, sing a rough vocal on them. They were little creations each day.

Bonzai: And how about that drummer?

Lynne: Of course, we had our pal Jim Keltner who was brilliant as always. Helluva great drummer, Jim, he's my favorite drummer—apart from Ringo. Don't get me wrong! [Laughs]

Bonzai: How did it happen with Roy Orbison? Just a cold call to him?

Lynne: Funnily enough, with Roy it was me as a fan from way before, in 1985. He was my favorite singer of all time. I got his number from my manager, Craig, and gave him a call in Nashville. It was just to say hello, really, and I was hoping he didn't tell me to sod off. But he was a lovely guy, very sweet, and he said, "Why don't you come down to Nashville and we'll try to write a song?" I was absolutely thrilled and went down, but we didn't actually finish anything. But it was such a pleasure hanging out with him at his house for about three days. We tried little bits and pieces but we never actually nailed anything.

About a year later, I got this call out of the blue saying, "Hi, it's Roy and I'm living in Malibu, and I'm ready to work." Brilliant! So, he came over to my house, and we wrote "You Got It," which is a pretty good one to start with, and then "Love's So Beautiful" and "California Blue." Tom was there too for "You Got It" and "California Blue." We just knocked these songs out. I had a little Casio plastic thing with Roy and Tom on guitar. It all came very quickly, and we recorded at Mike Campbell's garage and then mixed them at a big studio.

The songs came quickly—no time to sit and ponder, saying, "Oh, I wonder if that bit's right?" It was just done the way records used to be made, much like the Wilburys. You just do them, and if they're good, great; if they're not, don't try to squeeze more out than there is. It's a lovely way to do it, but it gets increasingly more difficult to do because you've got so many options.

Bonzai: Have the multitude of options created a trap?

Lynne: Well, you can disappear up your own whatzit, you know? You can just keep laboring on something that maybe doesn't want to be labored on. Three months later, you'll hear the tape after you've messed with it and you go, "Shit, it was really good like it was!" [Laughs] There is a danger of doing that. But it's true that you can improve songs. It's not guaranteed to mess them up. Sometimes you can actually get them better. But usually, a good song is so simple that you don't really have to change anything.

Bonzai: It's been awhile since George released a solo record. Is that in the works?

Lynne: Yes, it certainly is. Hopefully, we're gong to start on that soon. We've also been talking about another Wilburys one.

Bonzai: Great news!

Lynne: Well, there's been mumblings of it. I speak to George quite regularly, and he's up for it. I think Tom is, as well. We just have to catch Bob off the road.

Bonzai: Hard working Mr. Dylan. Hasn't it been great to see him the last couple of years?

Lynne: He's great, Bob. It would just be nice if we could get everybody together at the same time and get in that room and make some new tunes up, have some fun.

Bonzai: What about your solo career? It's been five years since *Armchair Theater*.

Lynne: I know, can you believe it? Don't tell EMI, though. I was supposed to have delivered the next one a year later. Just kidding, but I've got loads of songs ready to go. It's just a matter of singing and playing them. I just moved into a new house, and I'm building a studio, and that takes up a lot of time.

Bonzai: What pieces of major gear are you planning for your workspace?

Lynne: Just a nice English desk, made by Raindirk. I brought it from England, and I have two 24-tracks and lots of outboard gear.

Bonzai: What was your first musical instrument?

Lynne: Guitar, when I was 15.

Bonzai: A late starter...

Lynne: Yes, but I loved it so much. It sounds like the old cliché, fingers bleeding, but you don't care.

Bonzai: What kind of guitar?

Lynne: The first one I ever tried was a friend's guitar, an Elvis Presley plastic guitar with one string. I learned all the Shadows' songs on one string using one finger. I played all their songs, with one string up and down like a dervish up and down the neck. And then, my father bought me a Spanish guitar. It was a bit battered, but it worked and had six strings. That's what I learned on.

Bonzai: How about keyboards?

Lynne: Well, at my parents house, there was a piano in the front room. I sort of commandeered the front room with my instruments. There was a piano, so I used to transpose, play a chord and then find out what it was on the piano. It was just a simple process of learning, and eventually after a few months you become a little familiar with it, but they're all the same chord shapes, and it took me awhile to learn all the inversions.

The first songs I ever wrote were on that piano while in the Idle Race, and some in The Move. I just found it more interesting to write songs on a piano, maybe because there was more happening, with strange chords happening with the different bass notes, as opposed to on a guitar where you tend to just play chords and not figure out funny bass notes. These happened by accident, so I think that's why the keyboard was more interesting for me to write songs on.

Bonzai: At that early age, did you see your whole life unfolding as a musician?

Lynne: I wanted it to. I left school when I was 15. I could have stayed on but I dropped out because I wanted to go to work and get some money. Not very much money, of course. But I found that getting up at 7 o'clock in the morning wasn't going to work for me. I desperately didn't want to do that, and I desperately wanted to play guitar. I just had these little jobs where you didn't have to do much. You could hide and play guitar and sit there quietly practicing while you were supposed to be working. I got the sack on most of these jobs for not doing anything.

When I started out writing songs, I never used to listen to what was on the radio. I used to play my own stuff, the way I wanted it. I'd think, that's what I want.

So when this advert appeared in the Birmingham newspaper for a "keen lead guitarist," I went for the job. It was for a group called the Night Riders, which was my favorite group in Birmingham. I got the job, luckily, when I was 18.

The funny thing is, my mother used to come running up the stairs every morning, really early, saying, "Get out of bed, you lazy sod." So, I got this job and the first day, a Monday, she comes bounding up the stairs, "C'mon, get out of bed!" I said, "Listen, mum, I don't have to get up ever again. I'm a professional musician now." [Laughs] I was a bit cocky, I suppose, because I didn't realize maybe someday I wouldn't be one. I just figured that's what I was going to do. I had tunnel vision in that area.

Bonzai: Well, things seem to have worked out pretty well.

Lynne: Yeah, can't complain.

Bonzai: The situation in the music business is very different now than when you were getting started, isn't it?

Lynne: Oh, yeah, absolutely. It used to be so simple and easy and innocent, you know? You just made a record, and they'd go, "That's great, let's put it out." Then it would be in the charts. Either it was that simple, or I was doing good stuff, I don't know.

Bonzai: Any advice for a teenager today in 1996?

Lynne: Well, I think they've got it covered now. They all start out with a lawyer before they've written a song. It's a sad thing that it has to be that way, but it's a good thing for them. They don't fall in the hole of having problems in that area with contracts and all that.

Musically, I suppose, just try and be yourself and don't copy trends and just try and make your own music. When I started out writing songs, I never used to listen to what was on the radio. I used to play my own stuff, the way I wanted it. I'd think, that's what I want. I don't care what anybody else is doing. That's why I didn't really get into the heavy guitar thing. I felt I could write songs, and that was the most interesting for me, and then to produce them and play guitar. The passion was there, rather than going out on stage and doing big guitar solos. I wanted to make a whole thing, write it and then make it into a record. That was the biggest thrill—to see a real record, just a vinyl one. Wow, it's a record.

Bonzai: Is it still a thrill when a record comes out now?

Lynne: It's a thrill, but every time there is a bit of trepidation. Once it gets into the Top 20, it's a thrill, yeah. ■

For tonight's performance, the role of The Walrus will be played by roving editor Mr. Bonzai.

—FROM PAGE 186, DWIGHT TWILLEY

nately the debut album was far from finished when the single hit the charts, and "immediately after the single hit, Leon left Shelter, and the record company fell apart," Twilley recalls. "We had a second single, 'You Were So Warm,' bubbling under the charts, and then it all caved in." *Sincerely* was a critical smash when it finally came out in the summer of '75, but with Shelter in such disarray, it didn't fare particularly well commercially. In 1977, he cut a second album, the shimmering pop confection *Twilley Don't Mind* (my personal favorite), for Shelter, which by then had been absorbed by ABC. Working at the Sound Lab and Shelter Studios in L.A., Twilley and Seymour were aided again by Schaper (who got a co-production credit), Barth, Noah Shark and the mysterious fader-puller known simply as Max. Together they helped refine the Twilley sound, which combined the melodic sheen and layered sophistication of middle-period Beatles productions, with some of the raw slap-back verve of early Elvis. Whereas *Sincerely* took nearly a year to make, *Twilley Don't Mind* was cut in just two months—"a normal L.A. studio trip," Twilley calls it.

Twilley and Seymour split up after that second album, and though Twilley's subsequent albums definitely missed Seymour's warm vocal touch (Seymour had a successful solo career of his own for a few years; he died of cancer a couple of years ago), Twilley's songwriting gift remained undiminished, and his arrangement and production ideas continued to flower. Albums like *Twilley* (a.k.a. The Checker Board album because of its cover design) and *Scuba Divers* were filled with strong tunes and great performances (anchored, as always, by guitar phenom Bill Pitcock IV). During this period, Shark, Max and Schaper did much of the engineering, but Twilley also worked with engineer Clay Rose and with producers Jack Nitzsche and Chuck Plotkin on material that later became known as *The Great Lost Twilley Album*. Twilley says of his own studio chops, "I never was really a technical guy. I just knew enough to be able to tell the technical guys what to do, and I've always worked with really good engineers who understood what I was going after. I've always had a pretty good idea of what I want to hear, and I've usually also had some idea of how it could be done, but I wasn't actually in there turning knobs that often."

There's a timeless quality to Twilley's strongest songs that has allowed him to remain remarkbly true to his original musical vision without any of his work sounding particularly dated. It's not a tremendous leap from "I'm on Fire" to last year's "That Thing You Do" (written for the forthcoming Tom Hanks film of the same name), and Twilley is quick to admit, "Nothing's ever changed the way I make music. I've sort of been in my own world all along. I never really cared much about what other people were doing. In the beginning, Phil and I thought we were creating the next sound and that we'd alter radio," he says with a little ironic laugh. He does acknowledge at least a flirtation with one passing radio trend, however:

"In '84 began the period when everybody said, 'You've gotta have the drum machine,' so that was my drum machine phase. I think it began a really terrible time in recording, because the prevailing thinking there for a while was if the tempo wasn't absolutely perfect then it was a terrible mistake. I remember someone saying to me, 'Maybe you won't notice it, but the listener in Iowa will sense that something is wrong.' So I gave in—it was something I hadn't done, so I gave it a try. I'm still proud of that material, but it wasn't my favorite way to work, and I think they were wrong about that listener in Iowa."

Twilley has had a couple of minor hits through the years—such as "Girls" and "Little Bit of Love"—and he was, as he puts it, "one of the guinea pigs of the early days of MTV, which was interesting." But his career has never quite taken off the way many expected it to. He remains philosophical about it all, however, and proud of the fact that he's always been able to make a pretty good living off publishing royalties (having Tia Carrere sing his ballad "Why You Wanna Break My Heart" on the chart-topping soundtrack to *Wayne's World* was a boon for him) and occasional gigging. He's even got an unreleased album, *The Luck* (produced by Richard Podolor and engineered by Bill Cooper), in the can, ready to see the light of day if he can generate record company interest in it. About a year ago, too, he moved back to Tulsa after nearly two decades in L.A. "I went through one too many earthquakes," he says. "My house was so damaged [in the 1994 Northridge quake] that I had to move everything I owned out of it, and then I was thinking, 'Well, do I really want to just move down the block?' I'm really glad I came back [to Tulsa]. I was in L.A. not too

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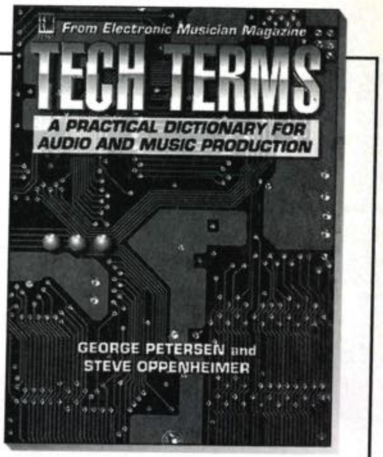
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long ago, and I couldn't believe I'd been there all those years."

These days, Twilley is still writing songs and is in the process of building a home studio, which he says he'll likely equip with "a few ADATs. It's nice that a lot of the equipment that used to be out of reach is now more inexpensive," he says. "It used to be it would cost you $5,000 to have echo, and now you get those little Alesis things for $250 and you sound pretty damn good. I always thought there was something wrong with the equipment thing, because it seems that guys like me and other artists, when they get to a certain stage, they shouldn't have to pay for the equipment. An artist should have paint. There should be people who sponsor recording artists, because equipment is too expensive." He pauses and then adds, "I can dream, can't I?"

He adds, "The record business is a lot more money-oriented and a lot less music- and artist-oriented than it's ever been. The general message of so much of what's on the radio is this sort of dark, urban thing. Well, every place in the world isn't dark and urban. Why is that all that's on the radio? One of the things I'm proud of in my career is that I've always tried to keep a positive message. I've never incited any riots or tried to lead anyone astray. I just do what I do, and there have always been enough people who like it that I keep on doing it. I'm always looking ahead." At the same time, *XXI* is a tuneful and invigorating look back at an artist who's always played by his own rules. ■

—FROM PAGE 172, LOUDON WAINWRIGHT III

for the most part all the emphasis was on getting Wainwright's best performance. Crucial to this end, Lesser says, was creating the proper atmosphere. *Grown Man* was recorded and mixed over a period of six weeks last year at RPM Studios in New York (with additional overdubbing at Knoop Music in New Jersey). Lesser says that for someone like Wainwright, who is used to interacting with audiences, the studio can be a very sterile environment. "RPM is a single-studio operation that's very homey and comfortable. When Loudon walked into the studio, his area to record in was set up kind of like a living environment and not like a recording studio. The lights were dimly lit; there was a reading lamp there; a nice, comfortable chair for him to sit in between takes; and a different chair to perform in.

"The studio also has amazing state-of-the-art vintage equipment," Lesser continues. "I say those words in the same sentence, but it really is the best of both worlds. The old Neve [8068] is wonderful, and the owner, Bob Mason, has been a collector of vintage tube mics for a long time, and he's got a great collection." Lesser miked Wainwright's Martin D-21 in stereo with a B&K 4011 up from the hole toward the neck, and a Neumann U67 on the body and wood. A little bit of pickup was mixed in, along with some direct run through a tube DI. "On a couple of the songs, we used the direct a little more," Lesser says, "but most of the time it's the acoustics of the mics in stereo."

Wainwright recorded his guitar and vocal parts simultaneously, without headphones (which Lesser says give him too much of a microscopic view of his sound). Lesser encouraged him to move around as much as he wanted. "But the phase-relationship of the three mics had to be totally locked in," Lesser says, "or all of a sudden his voice would sound very distant. We played a bunch with positioning. Occasionally, we would stop a take if he moved so far out of position that we started losing the sound. Of course, if the take is there, that's the primary thing. If there's a little bit of a funny sound, that takes a way, way back seat on a record like this."

Lesser used the studio's Stephen Paul-modified Telefunken ELAM 251 on Wainwright's voice, through an LA-2A and the Neve electronics to the Studer A800 24-track. Very little EQ or processing was added to the lead vocal, and the tracks are almost all wholly intact, unedited takes. "We also didn't do a lot of takes," Lesser says. "If he wasn't getting a tune, we'd generally move on to another song and come back to it later to get the spontaneity of that first-time performance."

With the key element of Wainwright's performance in place, the team began adding instrumental parts around the finished vocals. "Basically," Lesser explains, "if a song held up completely barebones guitar/voice, we would leave it like that." But where they saw the opportunity to enhance or augment the vibe of a song, they would bring in musicians one at time. ("To make a take sound natural that has so much give and take in terms of the metronome," Lesser points out, "you really have to [add parts] one at a time.")

Working out parts was a very collaborative, liquid process. Lesser and Wain-

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wright called on an intimate group of musicians whom they knew would be responsive to the nuances of Wainwright's songs and performances. "To get the best out of a musician," Lesser says, "you have to let them feel what they're feeling. It's probably impossible to tell a musician to play something exactly the way someone else wants it and expect it to be coming from their heart. We work with people because we respect their ideas. So we may give them a chord chart and a basic overview, and then what winds up on the record will be developmental as we record it—make suggestions, make edits here and there. I like the interaction between the musicians and songwriter."

One of the most intriguing interactions was between Wainwright and his 19-year-old daughter, Martha. She sang with him (against him?) on "Father Daughter Dialogue," a song recounting a dispute about songs. "Since she can sing," Wainwright says, "and since she was the person with whom I had the argument to begin with, it was an obvious choice. We did that one live—there's nothing punched in about that. So there was some interesting angst in the room."

Martha also sings backing vocals on "The End Has Begun," a dolorous tune about the end of a relationship. "The concept always sounded like marching off into the sunset or a funeral procession," Lesser says, "so we had [drummer] Richard Crooks do his parade-oriented cadence on the snare, which had no snares on it, so it gives it a kind of haunting, hollow sound." The song also features David Mansfield on the bouzouki, a large, double-stringed instrument similar to a bass mandolin. "That was David's suggestion," Lesser says, "and we loved it as soon as we heard it. He'd always wanted to try it on a record, and it was just perfect."

Mansfield also added smokin' electric guitar to the infidelity-minded rave-up "Just a John," a cut that illustrates the wisdom of having musicians play to Wainwright's finished track. "I don't think we could ever have gotten such a great take from Loudon himself if we'd recorded it with the heavy guitars and the drums from the beginning," Lesser says. "I think he would have been trying to push his vocals too hard over the bigness of the sound. As is, we have the combination of a punchy but intimate vocal surrounded by this tough, rockin' track." (Listen also for Wainwright and Lesser's chain-gang-style "cha's!" pulsing in the background.)

The success of the collaborations is audible throughout *Grown Man*—the record is rife with musical settings that make it easy to get caught up in Wainwright's warm, natural vocal performances. It may not be a fancy production, but it's loaded with personality and charm, like Wainwright's shows. "The vocal and the song are like the picture to me," Lesser says, "and the music and track are like the picture frame—you don't want the frame to interfere with your enjoyment of the picture. They should both work together perfectly.

"We chose to mix on the same board that we recorded on," he adds, "because we were enjoying the way the rough mixes sounded. It's not the kind of record that we wanted to hype up and sizzle out. We were into the warmth of the record, and to maintain that we stayed and mixed at RPM."

After the album was completed and ready for mastering (by Greg Calbi at Masterdisk), Lesser got a call from Wainwright, who had been struck by an interesting idea: opening the album with an a cappella track...sung in the shower. So they regrouped and set up in the shower at Beartracks Studio (Suffern, N.Y.), to record "The Birthday Present."

"I wanted spontaneity," Lesser says, "and I also knew they didn't have a really large hot water heater, so I wanted to have everything set up for capturing a single take." They set up a couple of U87s outside the shower but were nervous that they might not have enough presence on the voice. Co-engineer Steve Regina suggested putting a Shure SM57 in the shower under the water. The only problem was how to protect the mic.

"We decided to put a condom over it," Lesser laughs, "but of course nobody at the studio had a condom. So we had to send the 17-year-old female receptionist to the drugstore with strict instructions to get unlubricated, because we didn't want oil getting into the mic element. She was very embarrassed, but finally we convinced her to go. She came back around 20 minutes later and told us that the pharmacist had tried to talk her into getting the lubricated ones, saying she'd like them much better. She kept saying, 'No, you don't understand, this is for a recording session,' and the pharmacist was going, 'Yeah, sure kid.' "

"So we put the condom over the mic," Wainwright says, "and I actually took off my clothes—no one was there—took the shower and sang the song." ■

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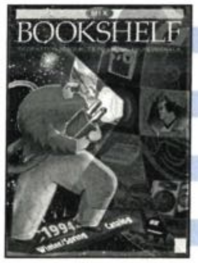

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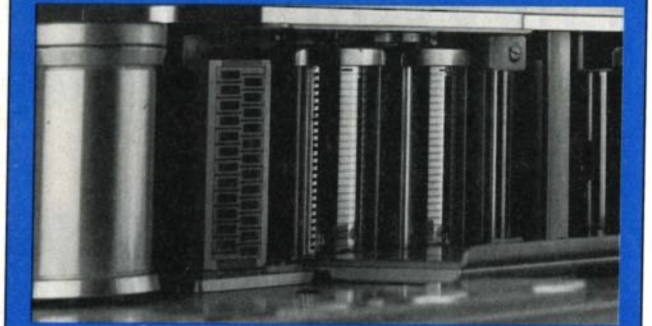

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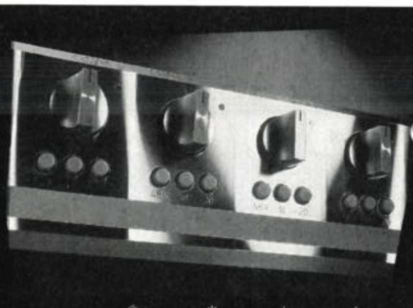

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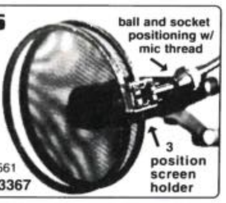

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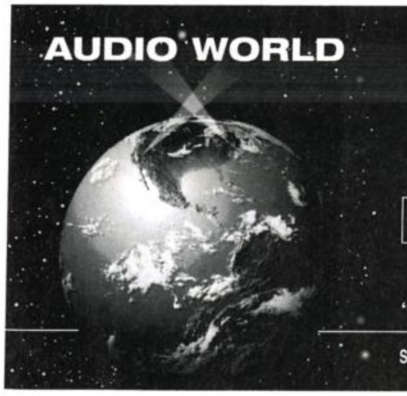

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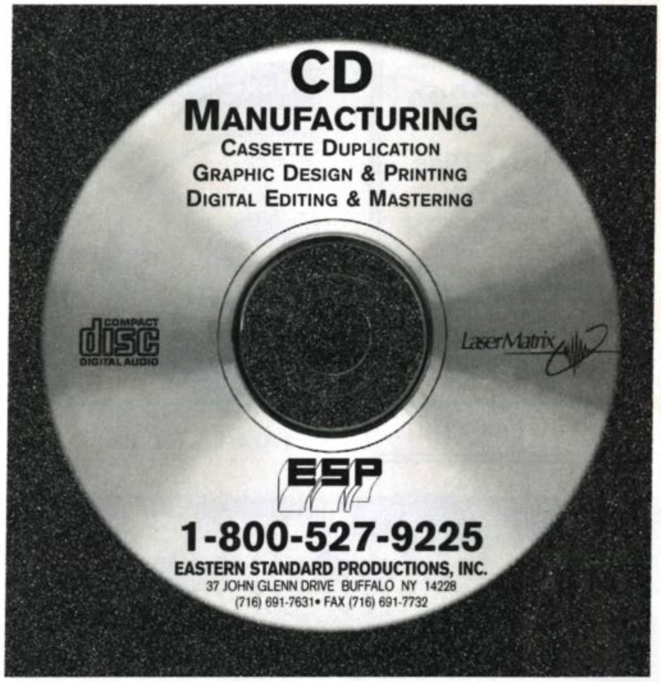

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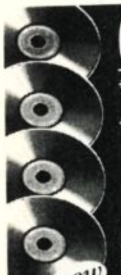

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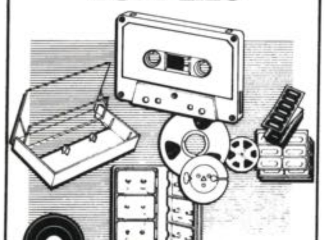

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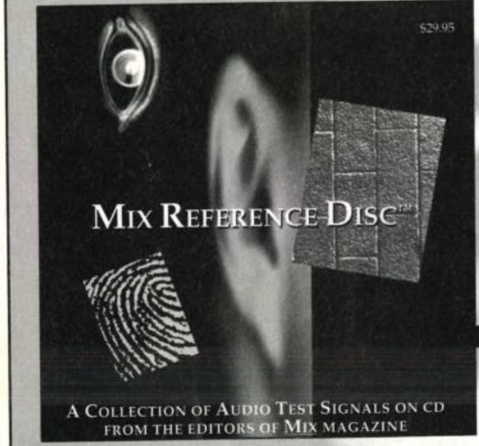
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INTERNATIONAL UPDATE

—FROM PAGE 74, INFLIGHT PRODUCTIONS

audio and video on demand. Before too long, all passengers will have individual video screens that offer a variety of films, short subjects, shopping programs, games, etc., as well as extensive music programming. "They'll be MPEG-encoded systems, where, instead of it being a tape source or a CD source, it's going to be driven from a hard disk file server, and this information will be downloaded to your seat. It will help the airlines in terms of space and reliability, and it will help with security—you won't have all these videos to lock up. They're doing things with technology that's on the ground but hasn't been generally used by airlines yet." The implications of this are tremendous as far as IFP is concerned. It's as if one company was providing all the audio and video programming for all three TV networks and was suddenly presented with *cable*. Business will be more than booming.

To increase the company's efficiency, and in preparation for big changes about to break in in-flight entertainment, IFP is in the process of building a large studio complex, designed by consultants AVD and architect Humphrey Cook, to accommodate the facility's audio and video operations under one roof. Mantle is working with consultants from SADiE to network the rooms and complete the company's transition from quarter-inch to all-digital editing. "The audio side is moving over in four months' time, and at that point we'll have gotten rid of all of our quarter-inch machines, and we're going to go for it," Mantle says. SADiE is also working alongside the IFP engineers to help develop new systems of working that will make the best use of the new digital equipment, and Mantle and his staff are really enjoying the rare top-priority attention. "If you're flying an airplane, obviously the most important thing is that the engines work, and the navigational equipment. And the avionics engineers have to look after everything electrical on the aircraft. So the priority is that the navigational system works. We're usually at the bottom of the list. But the marketing departments will tell us if they get complaints because the tape player stopped or the CD jumped, because for passengers, one of the benefits of flying anywhere is that the in-flight entertainment is good. It's become a big thing." ■

THE FAST LANE

—FROM PAGE 20, FOR SALE

spot by air? How about last year's Digidesign acquisition by Avid, or the even more recent Spectral ingestion by Euphonix? Then in the past there was Electro-Voice to Mark IV, Kurzweil to Young Chang and Hafler to Rockford. See? wherever there is audio, gasoline is nearby. There seems to be at least as much food chain activity in our little industry as there is in the software world.

What does it all mean?

SMELLY THINGS: BUSINESS

Sometimes these consolidations are a great improvement. There are situations where a small but technically cool little company has the chops to develop a very nice product, but just doesn't have the bucks to manage a competitive presence. Then maybe a nice big company comes along and offers to provide that financial clout in return for 60% to 90% or so of the little company. It is done, sales go up 1,500%, and all the people in the little company make more than they ever would have if they had tried to do it all alone, and the big company makes still more yet. Everybody wins—the original developers, the acquirers, and us, the customers.

> **It may be worth watching to see who really owns the company that made what you bought.**

Sometimes companies are bought just because a larger company wants to dominate the market the old-fashioned way—they buy it. They simply buy out their competition, tell everybody that there has been a "merger," and wait until somebody goes to the trouble to look into the deal and find out that it was an out-and-out acquisition. Then they claim that they will let the new acquisition run as an independent, wholly owned subsidiary for a year, and then they simply stop supporting the product and, when pushed, announce that the product is no longer made. A great trick if you've got the bucks: Buy your competition, murder it, wait a few more months and incorporate whatever good stuff they had that you didn't into your next toy.

And then there is Vulture Capital. This stuff is great. The little guy invents something and then can't quite get the money together to get it to market. The vultures come in and give him all the money he needs, in return for all the children he will ever have in his life, and all the children his neighbors will ever have. The little guy spends years developing the toy, the big guy brings it to market, and the original inventor stands at the exit of I-5 selling oranges to cars stopped in rush-hour traffic.

And this is nothing. Japan has technical alliances and acquisitions down to a true art! They generate and dissolve technical alliances and consortiums as needed to maintain a financial profile that is basically impossible to compete against. For some reason, every time an American company tries this elaborate financial/political balancing act, it falls over and goes boom. (Remember the big U.S. memory consortium about a year ago?)

Oh, yeah, the *point*. So what does all this get us? Well, in general, we, the audio industry, have been very, very lucky so far. The majority of all this dancing has actually helped the products, made them stronger, made them last longer. Though technical support seems to get worse as the owning company gets larger, the operation manuals get better, and the product usually gets tested more thoroughly to start with, so there are fewer technical problems to start with. All in all, this musical-chairs consolidation game doesn't seem to be hurting us. Keep in mind that this is pure luck; it could have easily gone the other way, as it has in many other industries.

Still, it may be worth watching to see who really owns the company that made what you bought, and then who buys the company that made what you own. It might still all go bad at any time, with no notice.

It's getting like the stock market—you might get stuck with heavy losses if you don't move fast when some big corporation makes a move. And you thought all you had to watch for was hardware obsolescence. Ha! ■

SSC owns no fewer than five perfectly good graphics programs and eleven audio ones that are now totally orphaned, after having been eaten and um...ejected by acquiring companies.

FEEDBACK

A N'AWLINS EDUCATION

Thanks for your stories about Cosimo Matassa and the New Orleans recording scene (March '96). As a staff engineer at Sea-Saint in the early '80s, I was fortunate to hear at least several thousand of Cosimo's stories about the people he recorded and the techniques he used to record them—everything from what Ernie K-Doe did with his first royalty check to why those Fats Domino records still sound so good today. I learned much more about the art and science of recording from those stories than I ever did in engineering school. Jay, you and Cosimo should write a book.

Now, more than ten years later, as an engineer in L.A., I use the knowledge I gleaned from the likes of Cosimo, Allen Toussaint, Skip Godwin, Roberta ("Queen of the ten-minute alignment") Grace and Marshall Sehorn as a young engineer in New Orleans every day. It's about time the importance of the New Orleans scene (past and present) is being recognized.

Bob Kearney
Tarzana, Calif.

BIG MACK ATTACK

Regarding the interview with Cosimo, it should be noted that it was not Jeep Harned who engineered/mastered those "great big band recordings." It was Mack Emerman, former owner of Criteria Studios. Criteria was the proving ground for early prototype MCI equipment in the mid- to late '60s. Mack and Jeep worked very closely in the development of the first MCI boards. I know because I worked as a bench tech for Jeep, then as an engineer for Mack, and I never saw Jeep touch a board.

And for the younger folks, it's Grampian (cutter heads) with a "G," not "Rampian."

Chuck Kirkpatrick
Cooper City, Fla.

P.S. Thanks for the Brian Wilson interview. The Beatles are why I started out in music. Brian is why I stayed.

MAKING A DIFFERENCE IN POLAND

Re: Paul D. Lehrman's "Truth and Consequences: What We Do Makes a Difference—Whether We Admit It or Not" (February '96).

I very much appreciated this article, but probably wouldn't have written except for certain personal events that happened in the past week. This part of the world has not forgotten (and probably never will) the events that took place during the Second World War, and yet, unbelievably, skinheads and neo-Nazis are increasing in popularity.

I was given the opportunity of cooperation with a certain studio that services, among others, a neo-Nazi clientele. The realization that I made is that there is a difference between servicing neo-Nazis who make music and neo-Nazis who make neo-Nazi music. I can't and don't agree with everyone, but as long as I don't help them preach what I don't agree with, I'm okay. Make sense? Anyway, I may have lost the whole gig because of this fragment of the studio's clientele. I plan to show the owners this article—maybe if no studios and engineers would be willing to help these animals, then young airheads wouldn't be able to listen to their rot and would stop turning into neo-Nazis.

An American in Gdansk, Poland

BALANCING ACT

I read with interest your articles on Broadway sound in the February '96 issue. As a theater sound designer myself, it is always interesting to hear what others are doing in our little neck of the audio woods. Keep it up.

I do have one gripe! In the "Looking in on *Master Class*" article by Mark Frink, he quotes specific delay settings for various systems at the John Golden Theater. Am I supposed to be impressed? Unfortunately, I am not familiar with the dimensions of the theater, and Mr. Frink makes no attempt to enlighten me. Had the article included the relative distances between performer and audience, and SR system and audience, as well as the delay settings for the different coverage areas, I could have worked out what Jon Gottlieb was working to achieve in his design.

Conversely, Mr. Frink could have told me! Far more useful would have been information about if the various systems were delayed for coherence or precedence, and what the relative delay/levels were at the listening positions for the direct sound vs. the reinforced sound. Or even simpler, was the delay used to correct multiple arrivals, or induce imaging, and how effective was it?

Mark Frink isn't wholly to blame for the way he wrote his article. Unfortunately, it highlights a trend in the audio industry, and the magazines that service that industry. I'm talking about the obsession with "gear," and the focus on what equipment you have, rather than how that equipment is used. Indeed, some articles in your magazine read like a catalog of sound equipment. I realize that it is what your advertisers want, but it's not what your readers really want or need. Mix engineers used to be called balance engineers. 'Mix' = Balance. Get it?

David E. Smith
David E. Smith & Associates
Boston, Mass.

MASTERFUL SOUND ON BROADWAY

Thanks for the detailed info in the article "Looking in on *Master Class*" by Mark Frink. I was really happy to have the info while on my way to the show last Saturday. From reading the article, I was looking forward to hearing excellent sound reinforcement, which I did. What you did not prepare me for was the absolutely amazing sound design production. It is an intricate tapestry. The weaving of live and prerecorded material was seamless, and it was brilliantly produced. The multiple levels of consciousness as expressed in the sound were impeccable, believable and enthralling. It is such a thrill to hear perfection. Bravo!

Howard Mandel
Manager of Special Projects
Rittenhouse Communications
Yardley, Penn.

Send Feedback to Mix, *6400 Hollis St. #12, Emeryville, CA 94608; fax (510) 653-5142; or 74673.3672@compuserve.com*

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Okay, bragging is too strong a word. But we are very proud when one of the most important, rule-breaking, producers in recording history has become a Mackie 8•Bus fan.

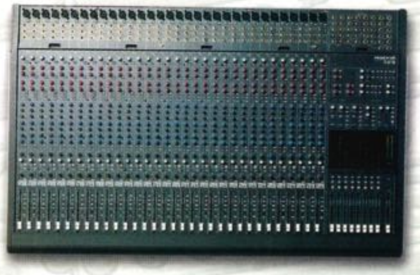
After all, Eddie Kramer's role in the making of popular music has changed its sound forever[1]. His recipe? *"Make a record unlike anything that's ever been heard."* So, while other engineers in London were churning out England's formula Pop of the Day, Eddie Kramer was across the console from a strangely-dressed young man from Seattle named Jimi Hendrix. Together, they broke practically every sonic and musical rule in sight. The result was an aural legacy of such originality that it still sounds amazing – even revolutionary – a quarter century later.

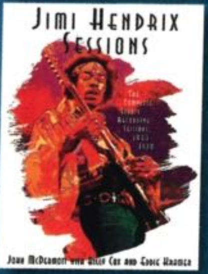
Eddie hasn't gotten any more conservative over the years. So it's not surprising that a man with Kramer's receptiveness to change would add a 32•8 to his creative arsenal. A mixing console that costs hundreds of thousands less than those he's worked on for most of his awe-inspiring career. A console he says he likes for its *"...sweet EQ, dynamic range, and cleanness."*

Eddie wanted to do more than just take advantage of the creative and lifestyle options afforded by the project studio revolution. He also wanted to help DRIVE it. So a year ago, we agreed to lend Eddie a 32•8 in return for his feedback. Since then, we've learned Eddie is not shy about expressing his opinions. Luckily they're mostly good[2].

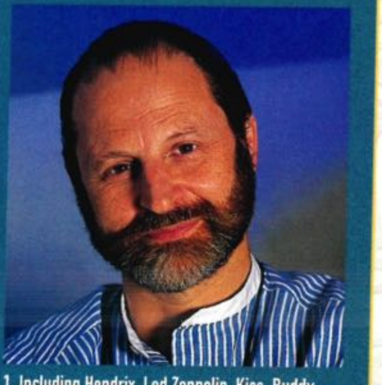
And Eddie Kramer recommends Mackie consoles to his associates, too[3]. In these cynical times (when pop stars accept millions to "endorse" products they admit later to having never tried), we at Mackie Designs think that's the only kind of "endorsement" worth having.

If you're in the market for a serious but affordable mixer, we hope you'll take a close look at the only 8-bus console Eddie Kramer says is worth having.





Sample Eddie's latest work on *"In From The Storm,"* RCA VICTOR a brilliant orchestral homage to Hendrix with an astonishing array of some of the best players in the world. Leave it to Eddie to break more rules. ('Net surfers should check out the RCA VICTOR® Web Page @ http://rcavictor.com.) For a great read, pick up the *Jimi Hendrix Sessions* book by John McDermott with Billy Cox and Eddie Kramer (Little Brown), and on video, *Adventures In Modern Recording* (available from Mix Bookshelf, 510-653-3307).



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[1] Including Hendrix, Led Zeppelin, Kiss, Buddy Guy, and more recently, his work with other Mackie mixer owners: Sting, David Abbruzzese, Vinnie Colaiuta, Stanley Clarke, Tony Williams, Steve Vai, and Carlos Santana.

[2] He hates the location of the 8•Bus' talkback button.

[3] According to Eddie, Eric Shenkman (Spin Doctors), Little Red Wagon Mobile Recording Studio, Bootsy Collins and John McEnroe have purchased 8•Bus consoles at his urging.

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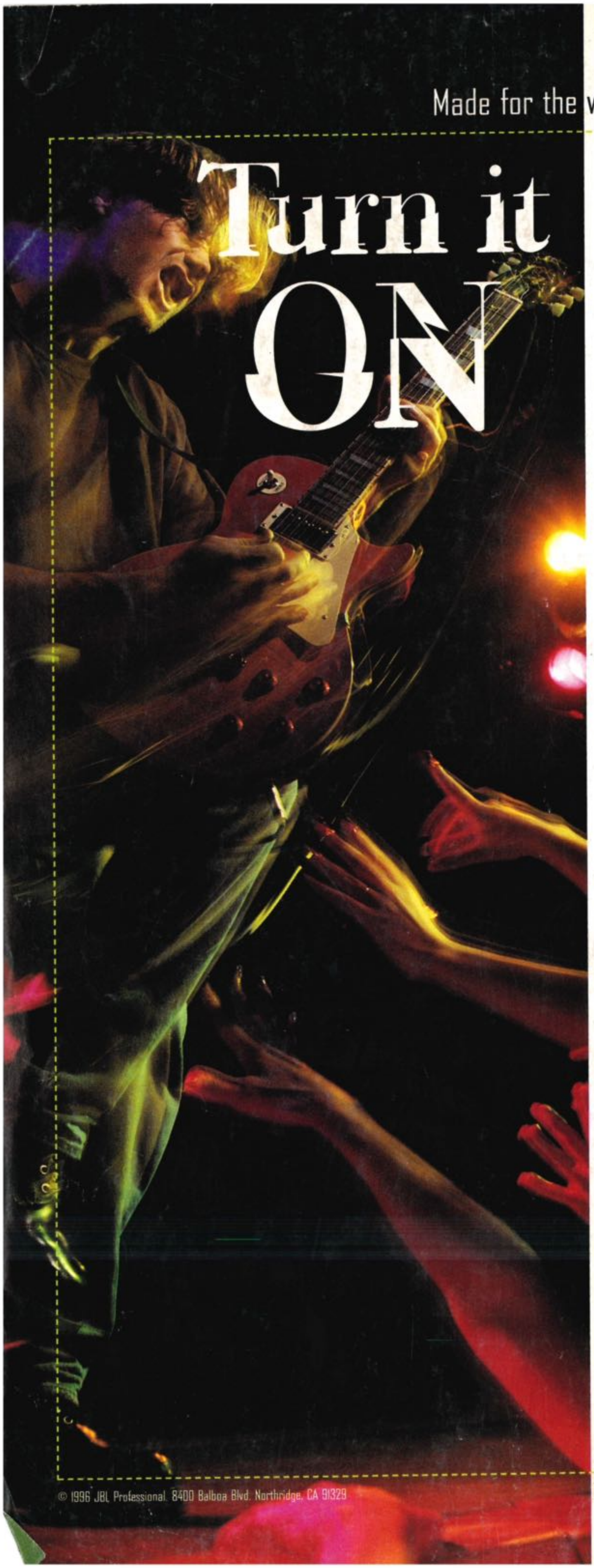

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Turn it ON

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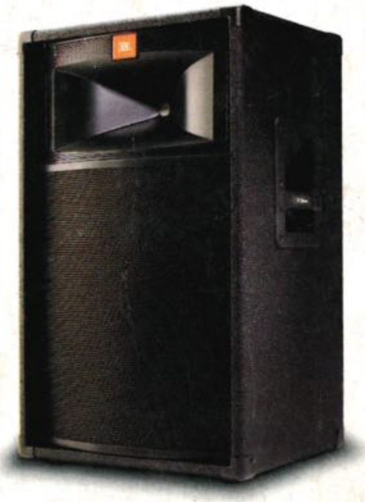

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At JBL our goal was to bring you a more affordable JBL speaker, not a cheap one. So turn it on. Turn it up. And give the new TR Series a listen. At this price, it's time to get a speaker that was made for the way you play.

JBL

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